Technical Appendix – Wisconsin Governor's Recommendation to US-EPA for Attainment and Nonattainment Designations - EPA Guidance Criteria Assessment – July 11, 2003 *(March 28, 2000 EPA Guidance memo)*

Nonattainment Area Boundary Assessment – 8-Hour Ozone – 2000

Title 1 of The Clean Air Act requires EPA to designate areas as nonattainment if they violate a particular ambient air quality standard or if they contribute to the violation of a nearby area that violates. In support of this designation, Governors develop a recommended list of nonattainment and attainment areas for their state. EPA reviews the recommendations, issues a proposed set of designations and provides states with a 120 day period to interact with the agency to refine its proposed area designations. After that time and within a specified period after promulgation of the ambient standard, EPA issues final area designations.

The active guidance from US-EPA regarding 8-hour ozone designations indicates that states should update or create their recommended areas for designation as attainment or nonattainment by July 15, 2003. Under a binding consent decree pursuant to prior litigation regarding the 8-hour standard, EPA will designate areas by April 15, 2004. For ozone, EPA first requested Governor recommendations in 2000 based on the 1997-1999 monitoring period. The 8-hour ozone standard has a form that uses a design value which is the average of the 4th highest 8-hour concentrations (no more than 1 per day) monitored at a particular site. Violation at a site is indicated if this value (truncated to three decimal places in ppm) equals or exceeds 0.085 ppm (or 85 ppb).

EPA has requested of states that this Governor's designation recommendation (2003) should include a set of specific area boundaries that is based on an evaluation of eleven general criteria. These criteria address the relationship, if any, of the counties which contain the specific ozone monitoring sites inside, adjacent or nearby to areas that record violation level air quality based on the 2000-2002 air quality data. EPA also requests that states notify EPA as soon in the 2003 season as any data would indicate (subject to final quality assurance) additional violating sites for 2001-2003 (even if based on an incomplete season record).

For ozone and fine particulate matter, EPA is maintaining a metropolitan area "default" boundary for designation purposes to reflect the Act's consideration of contribution to other areas when designating areas for the standard. This means that unless a well-documented assessment indicates otherwise, all the counties within a defined metropolitan statistical area or consolidated metropolitan statistical area (C/MSA) should be considered as violating the standard if one or more sites in the metro area violate. Because the formal federal metropolitan area definitions are undergoing a new definition by OMB during 2003, the evaluation of criteria contained in the active EPA guidance will be important for determining if the old or new metropolitan definitions are most appropriate to apply to decisions on the designation of particular areas as attainment or nonattainment. EPA has indicated that states should start their evaluations based on the standing (1999) C/MSA definitions but should assess most of the same measures used by OMB to redraw their metropolitan area boundaries.

Beyond the actual recorded air quality record for sites for 2000-2002, EPA indicates that evaluations of area boundaries should consider 11 additional criteria including:

- Emissions and air quality in adjacent areas (including adjacent C/MSA's)
- Population density and degree of urbanization including commercial development (signficant difference from surrounding areas)
- Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale)
- Location of emissions sources (emission sources and nearby receptors should generally be included in the same nonattainment area)
- Traffic and commuting patterns
- Expected growth (including extent, pattern and rate of growth)
- Meteorology (weather/transport patterns)
- Geography/Topography (mountain ranges or other air basin boundaries)
- Jurisdictional boundaries (e.g. – counties, air districts, existing 1-hour nonattainment areas, Reservations, etc.)
- Level of control of emission sources
- Regional emission reductions (e.g. – NOx SIP call or other enforceable regional strategies).

All of these criteria help with the definition of a most appropriate area boundary for purposes of designating state counties as attainment or nonattainment for the new standard.

For simplicity, the criteria and ensuing evaluation of sites and area boundaries have been ordered into eight general categories for the Wisconsin assessment. These include:

1. **Air Quality Data Trend – 2000-2002 Design Values and Critical Values for 2003 for Areas of Uncertainty regarding Violation Status**
2. **Characterization of Meteorology and Wind Patterns conducive to elevated ozone concentrations in violating areas**
3. **Population Density and Growth Characteristics**
4. **Travel – Aggregate Travel Levels, Travel Growth in Areas of Concern, and Commuting Patterns**
5. **Emission Levels for VOC and NOx**
6. **Existing jurisdictional boundaries as they relate to ozone area designations and Metropolitan Boundaries for areas recording violation or potentially contributing to violation air quality in nearby areas**
7. **Modeled episodic (June 2002) ozone contribution assessment for non-violating source areas adjacent or nearby to violating counties**
8. **Projected effect of regional strategies and the level of emissions control in areas assessed for contribution.**

Summary of Conclusions

Conclusions based on the evaluated criteria indicate no basis for shrinking the 1999 metropolitan boundaries, in particular for the southeastern counties of Wisconsin described by the Milwaukee-Racine metropolitan area.

The existing 6-county SE Wisconsin ozone nonattainment area remains a viable planning region and includes the Wisconsin portions of the Milwaukee-Racine and Chicago-Gary-Kenosha C/MSA's. Neither of these areas has been expanded in the most recently OMB-proposed metropolitan definitions reflecting the 2000 census.

The Sheboygan MSA (Sheboygan County) was a discrete 1-hour ozone nonattainment area, is identified as a single county MSA again for 2000 and is being recommended as a single county nonattainment area for 8-hour ozone. The county has not developed as a satellite to another metropolitan area and does not exhibit excess commuting by county residents to jobs in other areas.

The counties of northeastern Wisconsin violating the standard based on 2000-2002 data include Door, Kewaunee and Manitowoc counties. Along with Sheboygan, these counties are now attainment-maintenance for the 1-hour standard. Given their relatively low emissions and population bases and their location downwind of the primary VOC and NOx source areas causing ozone during key episodes, the three counties naturally form a single area for ozone control planning.

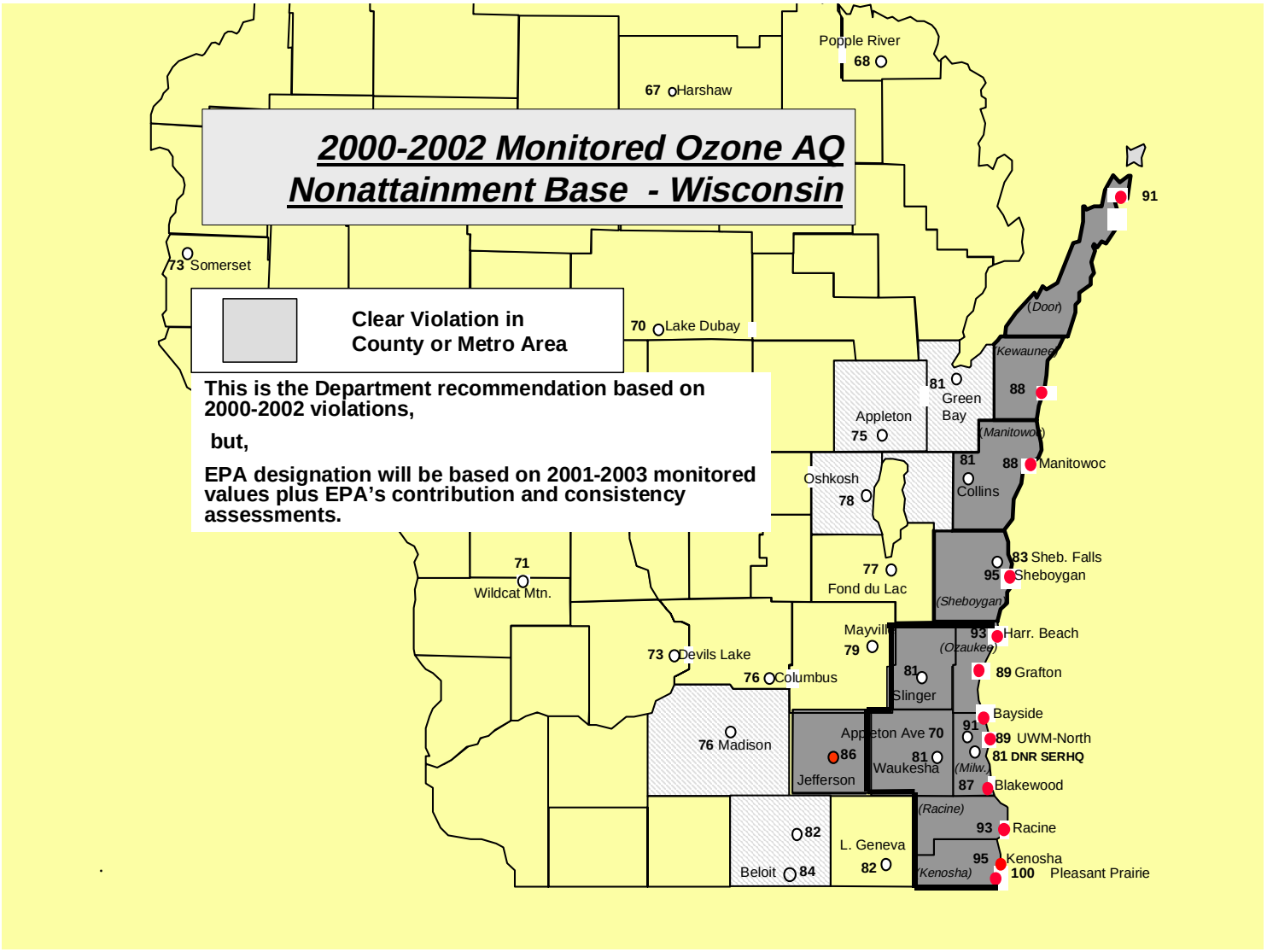
A contribution and emissions assessment based on a large set of counties adjacent to the violating areas indicates that additional Wisconsin counties do contribute to the violating ozone concentrations during key episodes. While the evaluated contribution is significant, the assessment does not clearly indicate that the incremental contribution of the nearby counties which are recommended for attainment status based on the 2000-2002 monitor data is overwhelming to the attainment status of the violating sites. In some cases the contributing counties are too distant to consider for nonattainment status under Wisconsin statute. Answers to the level of emissions contribution to violation and the level of reduction contribution from these areas critical to an attainment demonstration for the three areas recommended for nonattainment status may best be addressed during the crafting of those state plans.

1) 8-Hour Ozone Air Quality Data Trend

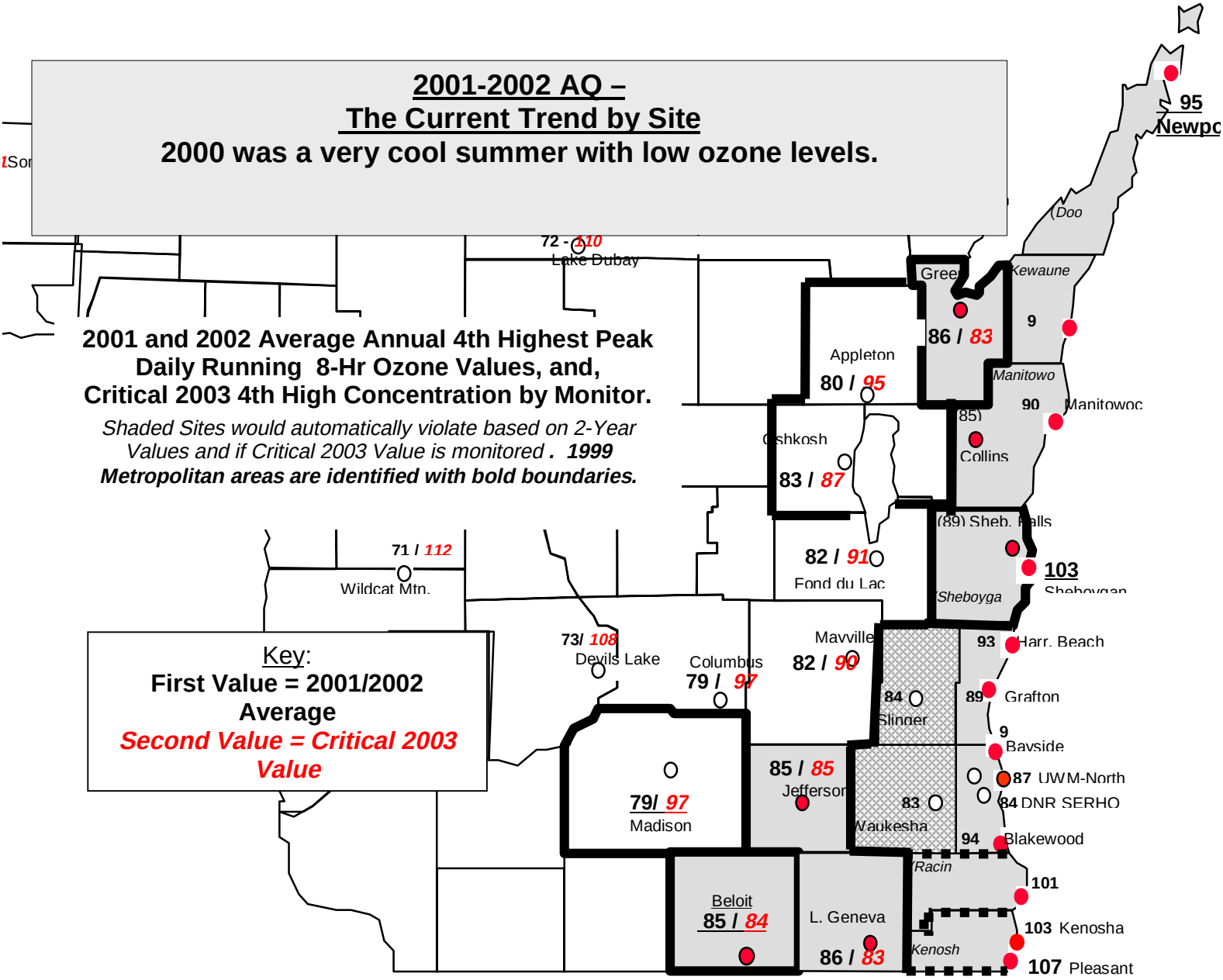
Two maps depict the ozone air quality record at the close of the 2002 ozone season. Map 1 indicates the calculated design values for 2000-2002. Map 2 indicates the two year 4th high average of the 2001 and 2002 ozone seasons and the "critical value" for 2003 which as a 4th high 8-hour concentration would trigger violations status. A table of the calculated design values follows. The table values do not consider data completeness and a Jefferson monitor site "official" design value of 0.86 ppm is not reflected in the calculated value (0.82 ppm)

Map 1 – 2003 Governor's Recommendation – Technical Support Document – Ozone Designations

Dark shaded area indicates county or metropolitan area violation based on 2000-2002 official monitor data. Numbers reflect the official design values considering data completeness and full QA. Some non-critical monitors are not shown on map but are included in the table. The Jefferson County design value is the result of incomplete 2000 season record due to construction. Earlier maps including this monitor reflect an 82 ppb design value which was calculated using incomplete data. The lightly-hatched counties reflect potentially contributing, upwind metropolitan areas based on 1999 OMB definitions. Based on 2003 OMB definitions, Fond du Lac, Oconto, Columbia and Iowa counties are newly defined as part of metropolitan statistical areas.



Map 2 – 2001-2002 Average 4th High Concentrations and 2003 Critical Values – Ozone Designations



The 8-hour ozone history in Wisconsin shows a relatively long-term trend of slow improvement in air quality in the areas close to or exceeding violation levels. Since the mid-80's, the average design values have dropped 2 to 3 ppb. Because of very high concentrations during 1987-89, which were associated with the 1-hour ozone area designations under the 1990 Clean Air Act amendments, the reported trend has shown a stronger improvement trend compared to that specific baseline. But comparisons to the mid-90's and to the mid-80's show the slower improvement noted. In general the trend is flat over the last 6 year period for most sites with a few in the more northeastern areas showing a slight worsening.

The technical presumption is that while localized VOC emissions have been significantly lowered in the 1-hour ozone nonattainment areas since 1990, the regional level of NOx emissions has gone down only very slightly. Even with the significant regional NOx reductions expected in states bordering Wisconsin due to the NOx SIP call, and considering EPA's projection of the impact of adopted and proposed federal and state controls through 2010, southeastern and northeastern Wisconsin areas are projected to remain nonattainment for 8-hour ozone after that time

[see EPA evaluations supporting their Clear Skies proposals conducted in 2002 and 2003].

Table 1 – Calculated 2000-2002 Design Values

(2 sites – 1 critical to county design value determination - have incomplete data for 1 or more years – Jefferson and UW-M)

WDNR Bureau of Air Mgmt **8-Hr Ozone Design Values** c:\data\8hro3\8ho3_00_01_02.xls

Preliminary 8-Hr O3 NAAQS Status 4 Feb 03

Wis DNR Ozone Monitoring Sites 2000 - 2002

Annual Rank	Site Name	2000 O3 Season(a) Yr	Mo	Day	Daily 8-hr peak (ppb)	2001 O3 Season(a) Yr	Mo	Day	Daily 8-hr peak (ppb)	2002 O3 Season(a) Yr	Mo	Day	Daily 8-hr peak (ppb)	2000-2002 8-hr O3 Design Values: Average of a site's annual 4th highest peak daily 8-hr O3 for 2000 – 2002 (ppb)	Truncated 8-hr O3 Design Value (ppb)	Unofficial, preliminary status with respect to the 8-hr O3 NAAQS (b)
1	Appleton	00	6	9	81	01	6	13	90	02	6	9	83			
2	Appleton	00	8	31	77	01	6	28	90	02	9	8	82			
3	Appleton	00	6	8	67	01	7	19	87	02	9	7	77			
4	*Appleton*	*00*	*5*	*3*	*66*	*01*	*6*	*27*	*85*	*02*	*6*	*24*	*75*	*75.3*	75	At or below NAAQS
1	Beloit	00	8	31	94	01	6	27	90	02	6	23	95			
2	Beloit	00	6	8	88	01	6	26	87	02	8	10	89			
3	Beloit	00	6	9	88	01	6	13	84	02	9	7	88			
4	*Beloit*	*00*	*9*	*2*	*83*	*01*	*6*	*25*	*84*	*02*	*6*	*9*	*87*	*84.7*	84	At or below NAAQS
1	Chiwaukee	00	6	9	87	01	7	31	113	02	6	22	127			
2	Chiwaukee	00	8	31	87	01	6	29	103	02	6	23	123			
3	Chiwaukee	00	6	8	86	01	8	5	101	02	8	11	121			
4	*Chiwaukee*	*00*	*9*	*1*	*86*	*01*	*6*	*13*	*99*	*02*	*6*	*24*	*116*	***100.3***	**100**	**Above NAAQS**
1	Collins	00	6	9	86	01	6	13	100	02	6	9	88			
2	Collins	00	7	26	81	01	7	16	90	02	9	8	87			
3	Collins	00	6	8	75	01	7	31	90	02	6	19	85			
4	*Collins*	*00*	*8*	*31*	*74*	*01*	*6*	*25*	*88*	*02*	7	16	82	*81.3*	81	At or below NAAQS
1	Columbus	00	6	9	86	01	6	27	86	02	6	9	87			
2	Columbus	00	6	8	77	01	6	26	84	02	6	24	86			
3	Columbus	00	8	31	74	01	6	28	83	02	7	16	83			
4	*Columbus*	*00*	*5*	*3*	*72*	*01*	*6*	*13*	*77*	*02*	*8*	*10*	*81*	*76.7*	76	At or below NAAQS
1	Devils Lake	00	6	9	84	01	6	27	79	02	6	9	80			
2	Devils Lake	00	5	3	77	01	6	28	77	02	6	24	77			
3	Devils Lake	00	6	8	77	01	6	26	76	02	6	18	75			
4	*Devils Lake*	*00*	*8*	*31*	*73*	*01*	*7*	*16*	*74*	*02*	*6*	*23*	*73*	*73.3*	73	At or below NAAQS
1	Fond du Lac	00	6	9	85	01	6	27	90	02	6	9	93			
2	Fond du Lac	00	8	31	78	01	6	13	88	02	6	24	87			
3	Fond du Lac	00	6	8	73	01	6	28	85	02	7	16	81			
4	*Fond du Lac*	*00*	*5*	*3*	*69*	*01*	*6*	*26*	*84*	*02*	*8*	*10*	*80*	*77.7*	77	At or below NAAQS
1	Grafton	00	6	9	83	01	7	31	118	02	9	8	106			
2	Grafton	00	7	26	82	01	6	13	101	02	6	9	99			
3	Grafton	00	8	14	81	01	7	16	101	02	6	24	97			
4	*Grafton*	*00*	*8*	*31*	*81*	*01*	*7*	*21*	*95*	*02*	*8*	*11*	*92*	***89.3***	**89**	**Above NAAQS**
1	Green Bay	00	6	9	87	01	6	13	99	02	7	16	88			
2	Green Bay	00	7	26	76	01	6	28	93	02	9	8	88			
3	Green Bay	00	6	8	72	01	7	31	90	02	6	9	84			
4	*Green Bay*	*00*	*5*	*3*	*71*	*01*	*7*	*16*	*88*	*02*	*6*	*19*	*84*	*81.0*	81	At or below NAAQS
1	Harr. Beach	00	6	9	91	01	7	31	116	02	6	24	101			
2	Harr. Beach	00	6	8	88	01	6	13	106	02	6	23	99			
3	Harr. Beach	00	8	31	88	01	6	29	104	02	9	8	95			
4	*Harr. Beach*	*00*	*7*	*26*	*86*	*01*	*7*	*16*	*102*	*02*	*6*	*19*	*93*	***93.7***	**93**	**Above NAAQS**
1	Harshaw	00	6	9	75	01	4	29	77	02	6	9	72			
2	Harshaw	00	5	3	71	01	6	28	77	02	5	28	67			
3	Harshaw	00	5	4	67	01	6	29	75	02	8	31	66			
4	*Harshaw*	*00*	*5*	*5*	*66*	*01*	*6*	*25*	*73*	*02*	*5*	*22*	*62*	*67.0*	67	At or below NAAQS
1	Jefferson	00	6	9	91	01	6	26	95	02	6	9	90			
2	Jefferson	00	6	8	87	01	6	27	90	02	6	23	87			
3	Jefferson	00	6	1	78	01	6	25	87	02	6	24	87			
4	*Jefferson*	*00*	*5*	*3*	*77*	*01*	*7*	*16*	*86*	*02*	*8*	*10*	*84*	*82.3*	86 - EPA	?? NAAQS Status ??
		(Yr 2000 – 77 ppb at Jefferson was calculated from incomplete data)														
1	Kenosha	00	6	9	89	01	7	31	110	02	8	11	118			
2	Kenosha	00	6	8	86	01	8	5	100	02	6	23	116			
3	Kenosha	00	8	31	85	01	6	29	97	02	6	24	113			
4	*Kenosha*	*00*	*9*	*1*	*81*	*01*	*6*	*13*	*96*	*02*	*6*	*22*	*110*	***95.7***	**95**	**Above NAAQS**
1	Kewaunee	00	6	8	88	01	7	31	100	02	6	23	106			
2	Kewaunee	00	8	31	87	01	6	13	96	02	6	24	100			
3	Kewaunee	00	7	26	86	01	7	16	95	02	9	8	96			

4	*Kewaunee*	*00*	*6*	*9*	*84*	*01*	*6*	*29*	*90*	*02*	*6*	*19*	*92*	***88.7***	**88**	**Above NAAQS**
1	Lake Dubay	00	6	9	85	01	6	28	78	02	6	9	77			
2	Lake Dubay	00	5	3	79	01	4	29	74	02	6	24	74			
3	Lake Dubay	00	5	5	73	01	6	29	73	02	9	8	74			
4	*Lake Dubay*	*00*	*8*	*31*	*73*	*01*	*6*	*25*	*72*	*02*	*5*	*28*	*73*	*72.7*	72	At or below NAAQS
1	Lake Geneva	00	6	8	83	*01*	6	27	101	02	6	9	98			
2	Lake Geneva	00	6	9	82	01	6	28	90	02	6	23	85			
3	Lake Geneva	00	10	1	80	01	6	13	89	02	7	16	85			
4	*Lake Geneva*	*00*	*8*	*31*	*76*	*01*	*6*	*26*	*88*	*02*	*6*	*24*	*84*	*82.7*	82	At or below NAAQS
1	Madison	00	8	31	77	01	6	27	91	02	6	9	84		8-hr O3 Design Value (ppb)	with respect to the 8-hr O3 NAAQS (b)
2	Madison	00	6	9	76	01	6	26	85	02	6	24	84			
3	Madison	00	6	8	72	01	6	28	83	02	8	10	84			
4	*Madison*	*00*	*9*	*2*	*71*	*01*	*6*	*13*	*78*	*02*	*6*	*23*	*80*	*76.3*	76	At or below NAAQS
1	Manitowoc	00	6	9	104	01	6	29	107	02	6	24	94			
2	Manitowoc	00	8	31	87	01	7	31	103	02	6	30	89			
3	Manitowoc	00	6	8	84	01	6	13	102	02	6	23	84			
4	*Manitowoc*	*00*	*7*	*26*	*84*	*01*	*7*	*16*	*97*	*02*	*8*	*10*	*83*	***88.0***	**88**	**Above NAAQS**
1	Mayville	00	6	9	87	01	6	27	89	02	6	24	92			
2	Mayville	00	6	8	81	01	6	13	86	02	6	9	88			
3	Mayville	00	8	31	78	01	6	26	83	02	8	10	85			
4	*Mayville*	*00*	*5*	*3*	*74*	*01*	*6*	*28*	*83*	*02*	*7*	*16*	*82*	*79.7*	79	At or below NAAQS
1	Milw-App Av	00	6	8	83	01	6	13	79	02	6	24	81			
2	Milw-App Av	00	6	9	80	01	7	31	78	02	6	23	79			
3	Milw-App Av	00	6	1	69	01	7	16	72	02	9	8	78			
4	*Milw-App Av*	*00*	*7*	*26*	*66*	*01*	*6*	*29*	*70*	*02*	*6*	*9*	*76*	*70.7*	70	At or below NAAQS
1	Milw-Bayside	00	6	8	88	01	7	31	113	02	9	8	101			
2	Milw-Bayside	00	6	9	87	01	6	13	101	02	6	9	100			
3	Milw-Bayside	00	8	31	84	01	7	16	97	02	6	24	100			
4	*Milw-Bayside*	*00*	*7*	*26*	*83*	*01*	*7*	*21*	*93*	*02*	*6*	*23*	*99*	***91.7***	**91**	**Above NAAQS**
1	Milw-Blakewood	00	6	9	86	01	7	31	110	02	6	23	104			
2	Milw-Blakewood	00	6	8	85	01	8	5	105	02	8	11	99			
3	Milw-Blakewood	00	6	1	75	01	6	13	98	02	9	8	98			
4	*Milw-Blakewood*	*00*	*10*	*1*	*73*	*01*	*7*	*16*	*95*	*02*	*6*	*9*	*93*	***87.0***	**87**	**Above NAAQS**
1	Milw-DNR_SER	00	8	14	71	01	7	31	98	02	8	11	100			
2	Milw-DNR_SER	00	6	9	70	01	7	16	89	02	9	8	95			
3	Milw-DNR_SER	00	7	26	70	01	6	9	86	02	8	10	84			
4	*Milw-DNR_SER*	*00*	*6*	*8*	*69*	*01*	*8*	*5*	*86*	*02*	*7*	*17*	*83*	*79.3*	79	At or below NAAQS
1	Milw-UWM_N	00	7	26	82	01	7	31	111	02	8	11	100			
2	Milw-UWM_N	00	8	14	81	01	6	13	96	02	9	8	95			
3	Milw-UWM_N	00	6	8	78	01	7	16	95	02	8	10	84			
4	*Milw-UWM_N(c)*	*00*	*8*	*31*	*77*	*01*	*8*	*5*	*92*	*02*	*7*	*17*	*83*	*84.0*	84(c)	At or below NAAQS
1	Newport	00	6	9	96	01	6	13	112	02	9	8	102			
2	Newport	00	7	26	86	01	7	31	107	02	8	10	100			
3	Newport	00	8	31	86	01	6	14	98	02	6	24	99			
4	*Newport*	*00*	*6*	*8*	*84*	*01*	*6*	*28*	*95*	*02*	*6*	*19*	*95*	***91.3***	**91**	**Above NAAQS**
1	Oshkosh	00	6	9	84	01	7	19	90	02	6	9	89			
2	Oshkosh	00	8	31	74	01	6	28	88	02	7	16	82			
3	Oshkosh	00	6	8	72	01	6	26	87	02	9	8	82			
4	*Oshkosh*	*00*	*5*	*3*	*68*	*01*	*6*	*27*	*85*	*02*	*6*	*24*	*81*	*78.0*	78	At or below NAAQS
1	Popple River	00	5	3	77	01	6	13	94	02	6	9	77			
2	Popple River	00	5	5	72	01	5	20	80	02	5	28	71			
3	Popple River	00	9	30	66	01	6	25	76	02	9	7	67			

4	*Popple River*	*00*	*5*	*4*	*65*	*01*	*6*	*29*	*75*	*02*	*6*	*19*	*66*	*68.7*	68	At or below NAAQS
1	Racine	00	6	9	87	01	7	31	108	02	8	11	114			
2	Racine	00	8	31	82	01	6	29	94	02	6	23	113			
3	Racine	00	6	8	80	01	6	13	92	02	6	22	112			
4	*Racine*	*00*	*9*	*1*	*78*	*01*	*8*	*5*	*92*	*02*	*6*	*24*	*111*	***93.7***	**93**	**Above NAAQS**
1	Sheb. Falls	00	6	9	84	01	7	31	103	02	9	8	98			
2	Sheb. Falls	00	7	26	83	01	6	13	98	02	6	9	90			
3	Sheb. Falls	00	8	31	83	01	7	16	95	02	8	10	89			
4	*Sheb. Falls*	*00*	*6*	*8*	*71*	*01*	*8*	*5*	*90*	*02*	*6*	*24*	*88*	*83.0*	83	At or below NAAQS
1	Sheboygan	00	6	9	105	01	7	31	116	02	6	23	123			
2	Sheboygan	00	6	8	98	01	6	29	109	02	6	24	116			
3	Sheboygan	00	7	26	90	01	6	13	106	02	6	30	106			
4	*Sheboygan*	*00*	*8*	*31*	*90*	*01*	*7*	*16*	*102*	*02*	*9*	*8*	*105*	***99.0***	**99**	**Above NAAQS**
1	Slinger	00	6	9	84	01	6	27	91	02	6	9	97			
2	Slinger	00	8	31	79	01	6	13	90	02	6	24	90			
3	Slinger	00	6	8	78	01	6	28	86	02	7	16	86			
4	*Slinger*	*00*	*10*	*1*	*76*	*01*	*6*	*26*	*82*	*02*	*9*	*8*	*86*	*81.3*	81	At or below NAAQS
1	Somerset	00	6	9	77	01	6	26	89	02	6	25	82			
2	Somerset	00	5	3	74	01	6	27	81	02	7	13	82			
3	Somerset	00	5	5	72	01	6	28	79	02	7	17	76			
4	*Somerset*	*00*	*6*	*8*	*72*	*01*	*6*	*29*	*73*	*02*	*7*	*14*	*71*	*72.0*	72	At or below NAAQS
1	Waukesha	00	8	31	81	01	6	28	90	02	6	9	94			
2	Waukesha	00	9	1	80	01	6	27	89	02	6	22	88			
3	Waukesha	00	6	8	79	01	6	13	87	02	9	8	85			
4	*Waukesha*	*00*	*6*	*9*	*79*	*01*	*6*	*26*	*83*	*02*	*7*	*16*	*83*	*81.7*	81	At or below NAAQS
1	Wildcat Mtn	00	6	9	80	01	6	29	73	02	6	24	74			
2	Wildcat Mtn	00	6	8	75	01	4	30	72	02	7	14	73			
3	Wildcat Mtn	00	8	31	75	01	6	28	72	02	6	9	72			
4	*Wildcat Mtn*	*00*	*4*	*30*	*71*	*01*	*4*	*29*	*71*	*02*	*6*	*19*	*72*	*71.3*	71	At or below NAAQS

(a) The official ozone monitoring season in Wisconsin is during 15 April - 15 October.

(b) The 8-hr ozone NAAQS is .08 ppm (84 ppb) for the arithmetic ave. of a site's annual 4th highest peak daily 8-hr ozone values for the 3 most recent ozone seasons.

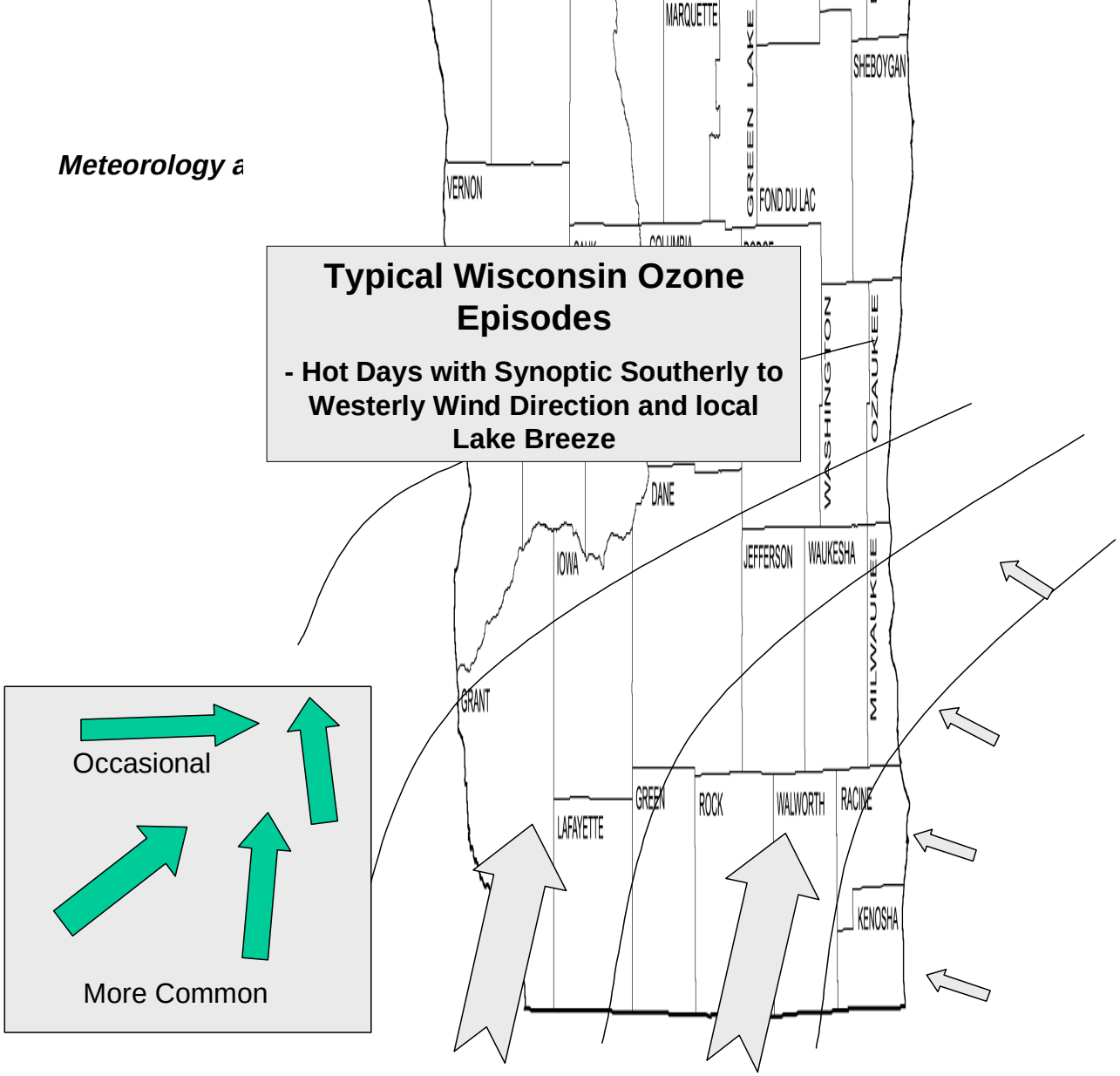
The NAAQS for 8-hr ozone is 0.08 parts per million (ppm), peak daily 8-hr running average. For purposes of significant digits, 0.08 ppm is numerically equivalent to 84 ppb.

A site is in violation of the 8-hr O3 NAAQS when the truncated ave. of its annual 4th highest peak daily values for the most recent 3 year period of valid data

(i.e., a site's 1999 - 2001 8-hr O3 "design value" [DV]) is 85 ppb or higher. These high value sites are noted with their 2000-2002 **Bold** 8-hr O3 DVs being listed in

(c) The ozone sensor at the Milwaukee-UWMN monitoring site was found to be operating incorrectly between 15 April - 28 June 02. Consequently, all of this site's ozone data during this period have been invalidated. This measurement period included a high ozone episode during 22-24 June 02. If Milw-UWMN's ozone data during this episode had been valid, the site would be have an 8-hr O3 design value above the NAAQS.

2) Meteorology a



The rough picture above shows typical surface conditions on a regional scale during the most typical ozone episodes in Wisconsin. As noted, surface wind direction can vary from SSE to WSW during most episodes. Along the lake shore an onshore breeze sometimes develops which facilitates the development of higher peak 1-hour and 8-hour concentrations than is typical when the onshore breeze does not develop. In the upper Midwest, higher ozone concentrations occur under the influence of high pressure systems east of the Lake Michigan basin. Elevated ozone levels can reach several hundred miles to the northeast and east. Less frequently, high levels of ozone are modeled to occur significantly north of the Great Lakes. Eight-hour ozone concentrations exceeding 85 ppb occur in Eastern Wisconsin and extend over multi-day episodes into the eastern US.

Evaluation of ozone transport in the Lake Michigan region over the last decade has indicated that significant levels of ozone and ozone precursor (VOC and NOx) transport into and out of the lake basin region during elevated ozone episodes. As a consequence, emission sources local to the violating areas are only part of the contributing source base and often are more important to ozone formation downwind than to their own concentration levels. Only where there is relatively high levels of ambient NOx concentrations at the ground level do the immediate area/county emissions impact ozone concentrations because of the secondary nature of the pollutant. In these cases the higher NOx concentrations tend to depress the ambient ozone levels, a reason ozone concentrations are monitored at lower concentrations in the densest urban areas such as downtown Chicago and Milwaukee.

The separation of local emissions impact from measured ozone concentration is dependent on the speed of transport of the ozone and its precursors in the mixing layer of the atmosphere. Upper air wind speeds of up to 10-20mph are typical under these conditions so the scope of transport impacting ambient concentrations often exceeds 100 miles during a single day of an episode.

3) Population Density and Growth Patterns

Wisconsin population is growing approximately 0.65% per year on average for the period 1980-2000. This reflects an aggregate statewide growth of approximately 14%. The highest rates of growth and the highest density in regional population occurs in the southeastern 1/3 of the state. The area southeast of a line between Green Bay and Beloit and including Madison includes roughly 70% of the state population. The counties around Madison, the Fox Valley and immediately surrounding Milwaukee are the most rapidly growing. The next highest growth is occurring in the western counties adjacent to the Minneapolis/St. Paul metropolitan area.

Table 3-1 details the 2000 estimated population, population growth and population density (on land area) data for eastern and southern Wisconsin counties assessed for their ozone attainment and nonattainment status in 2003. The following maps portray the data by county and census tract.

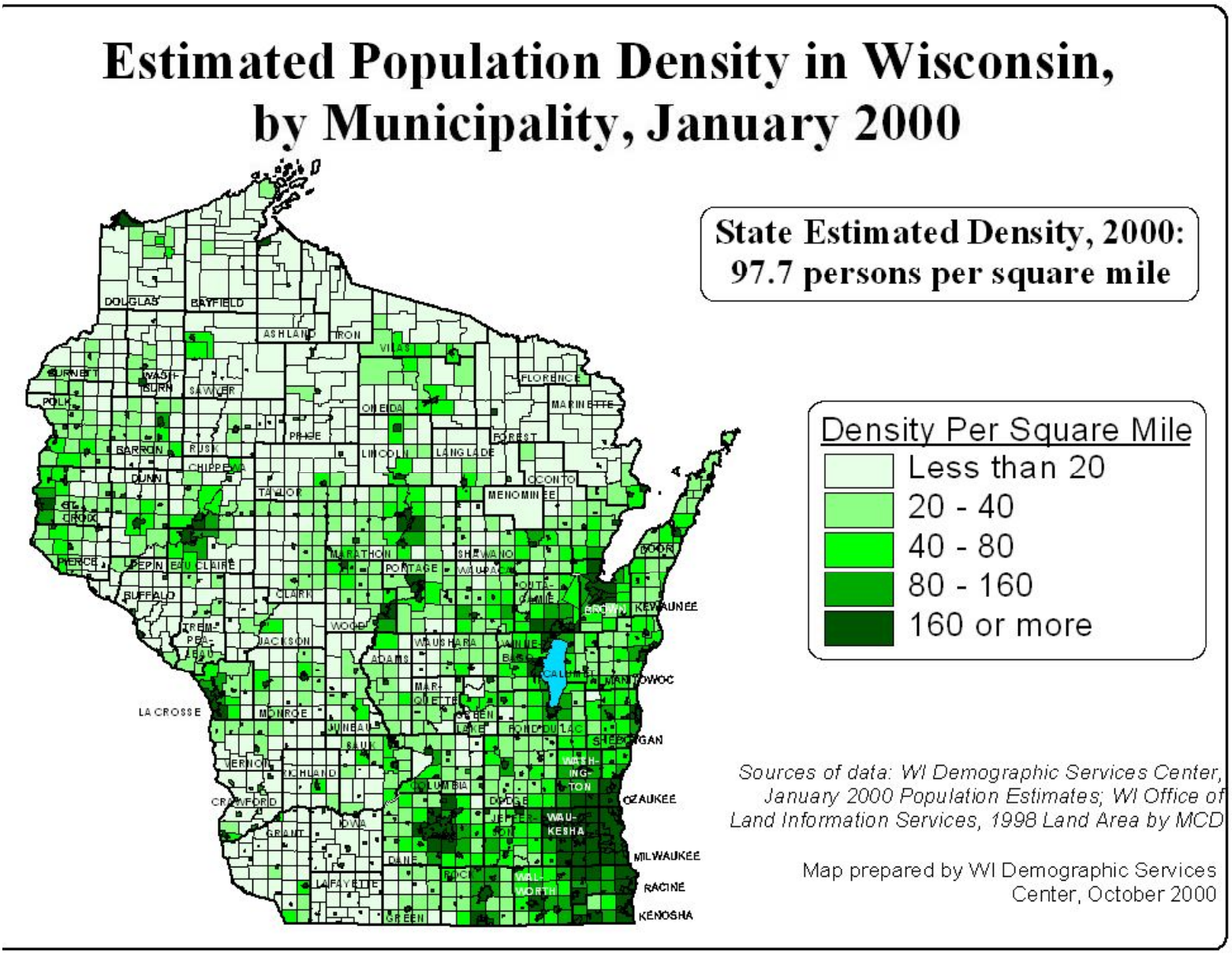
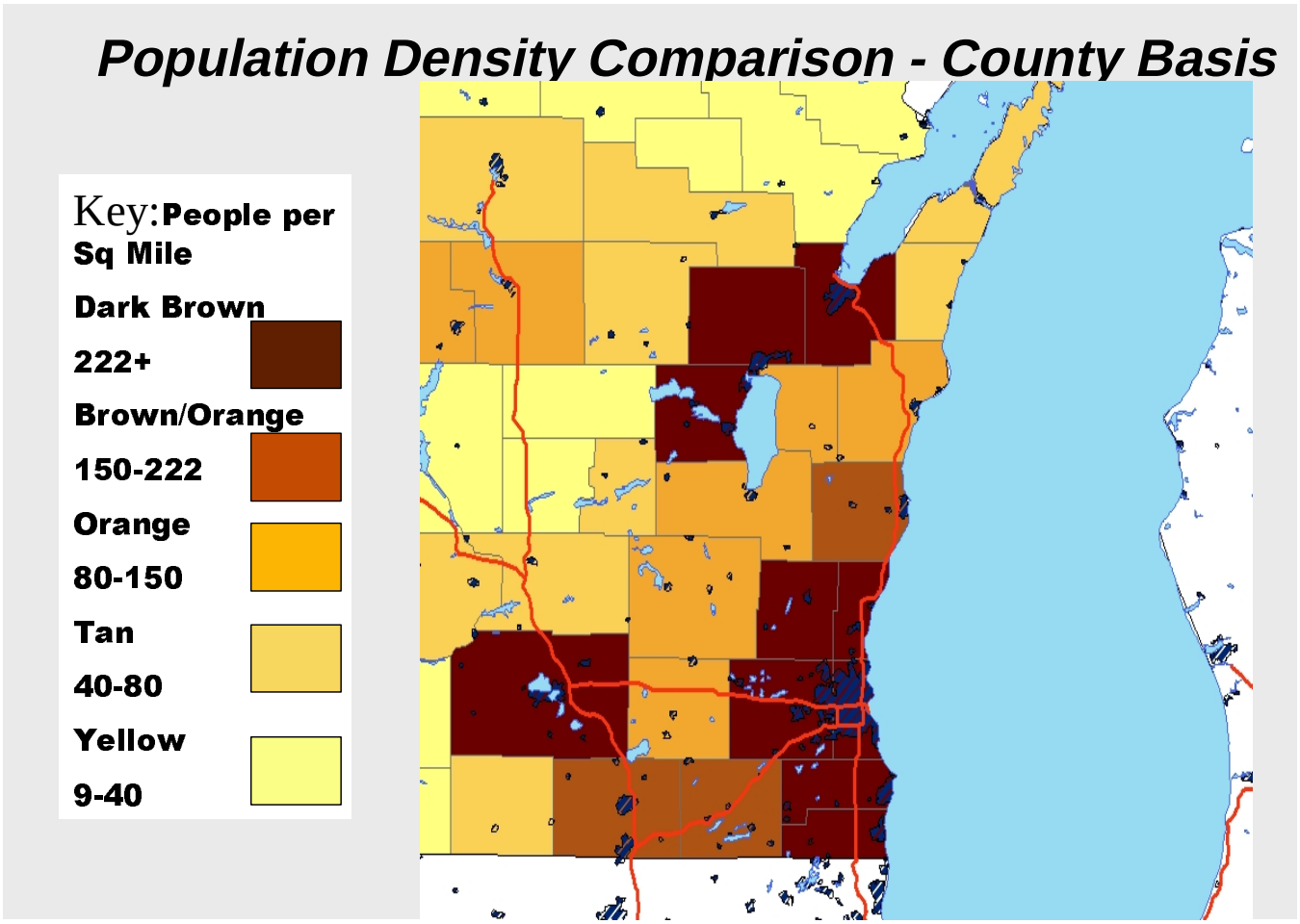


Table 3-1 Population and Population Growth by County – WI Counties Evaluated for Nonattainment Status

County	Population Rank	Population Density Pop per Sq Mile of Land Area	Population Growth 1980-2000	Population 2000 # (Rounded)
Milwaukee (Milwaukee/Racine CMSA)	1	3,896	(-3%)	940,000
Waukesha (Milwaukee/Racine CMSA)	3	663	29%	361,000
Racine (Milwaukee/Racine CMSA)	5	572	9%	189,000
Ozaukee (Milwaukee/Racine CMSA)	19	362	23%	82,000
Washington (Milwaukee/Racine CMSA)	11	280	39%	117,000
Kenosha (Chicago/Gary/Kenosha CMSA)	9	561	22%	150,000
6 Co SE Wisconsin Subtotal			***8.6%***	***1,839,000***
Sheboygan (Sheboygan MSA)	*12*	*222*	***12%***	***113,000***
Manitowoc	*18*	*142*	*0%*	*83,000*
Kewaunee	*51*	*60*	*3%*	*20,000*
Door	*44*	*60*	*12%*	*28,000*
3 Co NE Wisconsin Subtotal			***2.8%***	***131,000***
Dane (Madison MSA)	2	365	32%	427,000
Brown (Green Bay MSA)	4	439	29%	227,000
Winnebago (Appleton/Neenah /Oshkosh CMSA)	7	363	19%	157,000
Outagamie (Appleton/Neenah /Oshkosh CMSA)	6	259	25%	61,000
Rock (Janesville-Beloit MSA)	8	214	9%	152,000
Calumet (MSA) (Appleton/Neenah /Oshkosh CMSA)	35	133	32%	41,000
Fond du Lac	14	136	9%	97,000
Columbia	26	69	21%	52,000
Jefferson	21	139	15%	76,000
Dodge	17	99	14%	87,000
Walworth	15	170	31%	95,000
11 Co Collar Area Subtotal			***23%***	***1,572,000***
Total 21 County Evaluation Area			*14%*	*3,688,000*
Wisconsin State Total	*100/sq mi*		*14%*	*5,364,000*



4) Travel Levels and Commuting Patterns

Wisconsin total travel is growing approximately 3% per year on average from a 1985 base. The aggregate travel growth over that period was 56%. Areas of eastern Wisconsin associated with the Milwaukee-Racine, Green Bay and Appleton-Neenah-Oshkosh metropolitan areas exhibit relatively higher rates of inter-county commuting and aggregate travel growth. The increase in development of previously agricultural areas of eastern and southern Wisconsin is leading to an expansion of the metropolitan boundaries in the Madison and Green Bay areas and is reflected by the higher travel growth rates in areas with the primary transportation corridors.

Though high commuting patterns occur in the non-metropolitan counties of southeastern Wisconsin, the rates are not high enough to trigger the incorporation of those counties (Dodge, Jefferson, Walworth) into the defined metropolitan area that is based on the 2000 census. Within that 5-county Milwaukee-Racine metropolitan area there is a very high and increasing level of inter-county commuting.

In northeastern Wisconsin, the relatively low population counties of Kewaunee and Oconto are rapidly developing in the areas abutting the Green Bay area. As a consequence, those two counties have been incorporated by the federal government along with Brown County into the formal Green Bay metropolitan area. The primary criteria for their inclusion is a high rate of inter-county commuting combined with sufficiently dense residential pattern to be considered as urbanized development.

In the Madison area high inter-county commuting rates combined with rapid residential development in peripheral counties has triggered the inclusion of Columbia and Iowa counties within the Madison metropolitan area. Sauk County contains the more isolated micropolitan area of Baraboo.

Table 4-1 details the estimated travel and travel growth data for eastern and southern Wisconsin counties assessed for their ozone attainment and nonattainment status in 2003. Implications of the higher commuting rates noted below are discussed in the section on jurisdictional boundaries and economic linkage. Counties within metropolitan area boundaries are noted.

Table 4-1

Wisconsin Counties – Travel Data Evaluated in 21 Counties for Designation Assessment

	Travel (WI-DOT Estimates based on HPMS) Daily Vehicle Miles Traveled)			Workforce Inter-County Commuting Pattern	
	1985	2000	1985-2000	2000	
County	DVMT	DVMT	Growth	Outbound	Inbound
MILWAUKEE (CMSA)	15,174,700	21,355,400	41%	19%	26%
WAUKESHA (CMSA)	6,055,600	10,828,000	79%	38%	43%
RACINE (CMSA)	2,849,300	4,407,100	55%	32%	21%
KENOSHA (CMSA)	2,321,400	3,903,300	68%	44%	24%
WASHINGTON (CMSA)	2,112,200	3,482,900	65%	50%	34%
OZAUKEE (CMSA)	1,638,200	2,706,300	65%	48%	43%
SHEBOYGAN (MSA)	1,866,600	2,749,200	47%	12%	36%
MANITOWOC	1,541,200	2,272,200	47%	20%	10%
DOOR	719,100	957,100	33%	11%	8%
KEWAUNEE (new MSA)	356,300	471,400	32%	45%	23%
DANE (MSA)	7,033,000	12,497,100	78%	5%	14%
BROWN (MSA)	3,530,700	6,048,000	71%	8%	20%
ROCK (MSA)	2,898,900	4,429,600	53%	22%	15%
WINNEBAGO (CMSA)	2,779,100	4,433,900	60%	25%	31%
OUTAGAMIE (CMSA)	2,671,100	4,146,500	55%	30%	36%
WALWORTH	1,860,900	2,983,000	60%	37%	26%
FOND DU LAC (new MSA)	1,985,500	2,830,900	43%	28%	21%
COLUMBIA (new MSA)	1,497,100	2,873,700	92%	48%	33%
DODGE	1,541,500	2,449,000	59%	40%	29%
JEFFERSON	1,536,900	2,568,100	67%	40%	32%
OCONTO (new MSA)	886,500	986,900	11%	50%	20%
CALUMET (CMSA)	603,900	940,800	56%	59%	40%

Travel Growth Rate Comparison - County Basis

Key:

1985-2000

Annualized Daily Travel Growth Rate

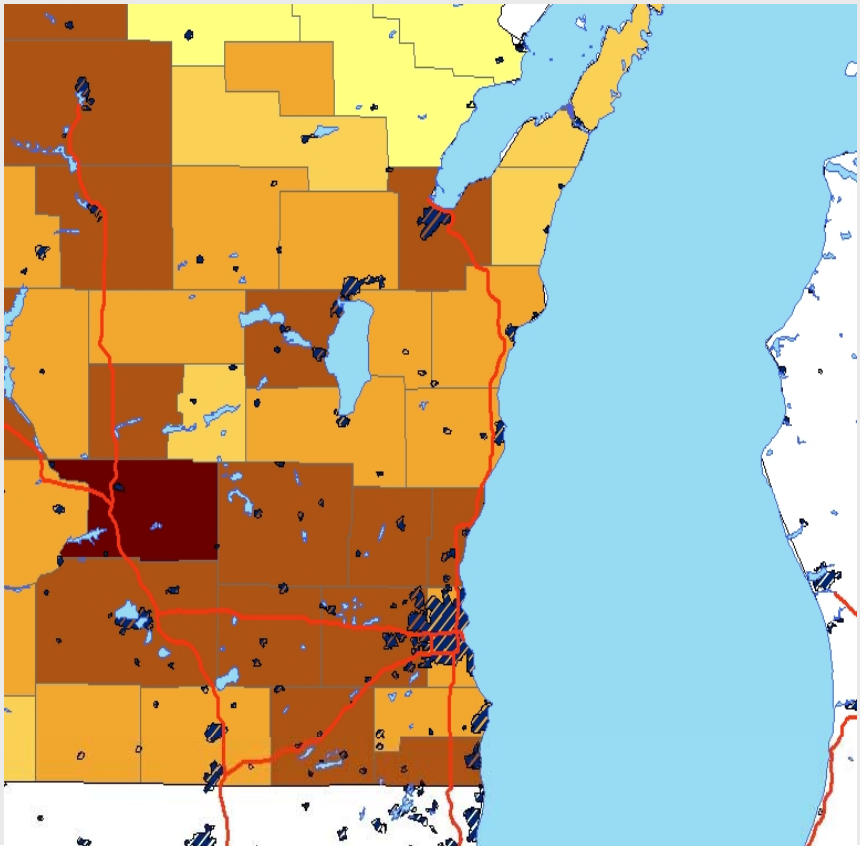
Dark Brown
4-6%

Brown/Orange
3-4%

Orange
2-3%

Tan
1-2%

Yellow
<1%



VOC and NOx Emission Characteristics

EPA data for estimated county emissions of VOC and NOx is developed as part of the ongoing National Emissions Inventory. The data is presented here on maps and in tabular form. In addition, state records of point source emissions for 2001 and projected mobile sector emissions are presented for VOC and NOx for the counties being evaluated for their ozone attainment and nonattainment status.

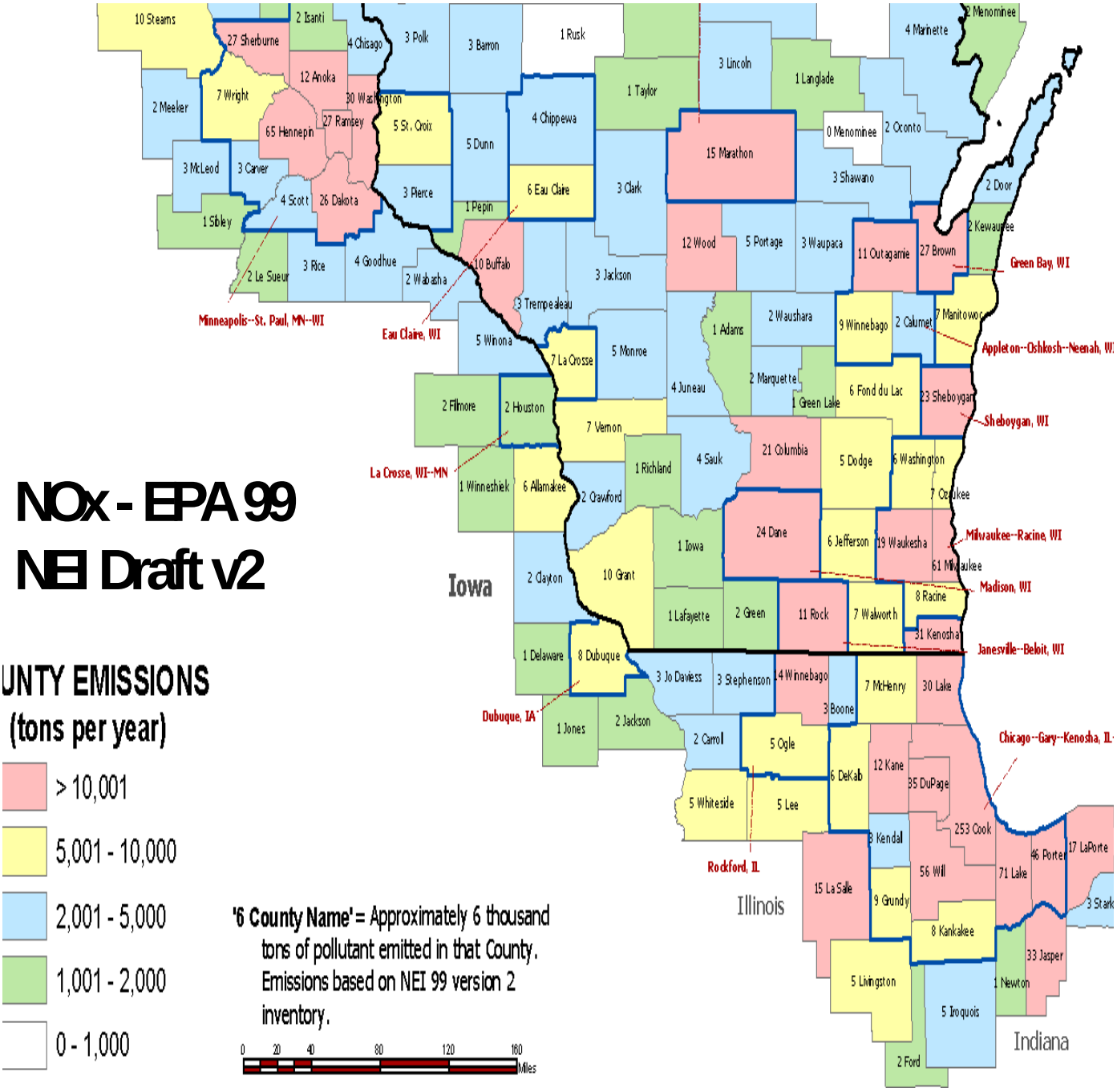
NEI v2 Annual Emissions Rank by County

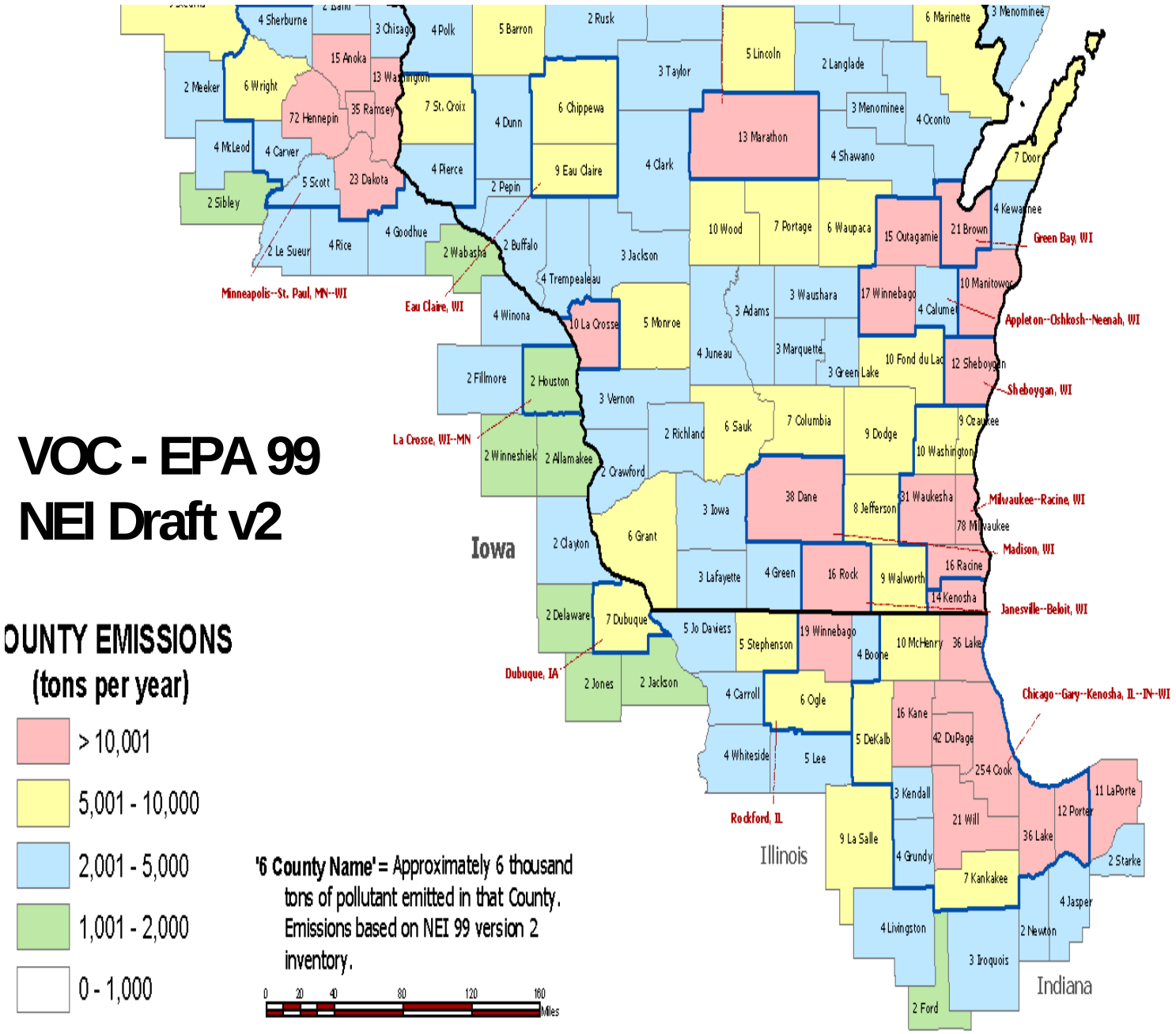
County	VOC Rank	VOC Tons	NOx Rank	NOx Tons
Milwaukee (MSA)	1	77,681	1	60,587
Waukesha (MSA)	3	31,389	7	19,229
Racine (MSA)	6	15,756	15	8,353
Ozaukee (MSA)	18	9,147	16	7,423
Washington (MSA)	11	9,825	21	6,298
Kenosha (MSA)	9	14,036	2	31,341
6 Co SE Wisconsin Subtotal		***157,851***		***133,231***
Sheboygan (MSA)	*11*	*11,797*	*5*	*22,607*
Manitowoc	*13*	*10,066*	*18*	*7,027*
Kewaunee (MSA ?)	*46*	*3,698*	*55*	*1,514*
Door	*22*	*7,183*	*51*	*2,065*
4 Co NE Wisconsin Subtotal		***32,744***		***33,213***
Dane (MSA)	2	37,739	4	24,203
Brown (MSA)	4	20,949	3	26,631
Winnebago (MSA)	5	17,045	14	8,642
Outagamie (MSA)	8	15,253	10	11,468
Rock (MSA)	7	15,508	11	10,541
Calumet (MSA)	51	4,265	47	2,317
Fond du Lac (MSA)	15	9,761	22	5,677
Columbia (MSA ?)	23	7,053	6	21,397
Jefferson	21	7,848	24	5,587
Dodge	20	8,700	25	5,096
Walworth	17	9,284	20	6,503
11 Co Collar Area Subtotal		**153,405**		**128,062**

WI-DNR Estimates - Annualized Summer Day Mobile and Annual Point Source Emissions by County

County	WI-DNR Mobile Sector Estimate for 2001 Annual*		WI-DNR Point Source Inventory for 2001 Annual	
	VOC Tons	NOx Tons	VOC Tons	NOx Tons
Milwaukee	6,909	15,641	3,142	28,102
Waukesha	3,500	7,923	1,475	508
Racine	1,418	3,210	675	703
Ozaukee (MSA)	875	1,981	198	3,365
Washington (MSA)	1,131	2,561	244	249
Kenosha	1,267	2,869	300	18,430
6 Co SE Wisconsin Subtotal	***15,100***	***34,185***	***6,034***	***51,357***
Sheboygan	1,454	2,744	947	13,428
Manitowoc	1,301	2,421	652	1,083
Kewaunee	266	390	153	16
Door	523	830	53	10
4 Co NE Wisconsin Subtotal	***3,544***	***6,385***	***1,805***	***14,537***
Dane	7,256	14,577	1,227	2,758
Brown	3,684	6,120	1,868	14,055
Winnebago	2,586	4,235	2,956	917
Outagamie	2,457	3,945	1,403	3,772
Rock	2,600	5,589	1,585	1,108
Calumet	535	929	246	64
Fond du Lac	1,642	2,820	855	456
Columbia	1,532	4,329	715	17,450
Jefferson	1,430	3,596	603	404
Dodge	1,331	2,359	566	457
Walworth	1,540	2,600	319	294
11 Co Collar Area Subtotal	***26,593***	***51,099***	***12,343***	***41,737***

** Mobile Sector Annual Emissions are developed here only for comparative purposes. These are not official estimates, budgets or projections and should not be considered in any conformity analysis. The number is calculated by multiplying a hot summer day Inventory by 330 to derive an "annualized summer day" estimate. [v. TA-7]*


NOx - EPA 99
NEI Draft v2
UNTY EMISSIONS
(tons per year)
> 10,001
5,001 - 10,000
2,001 - 5,000
1,001 - 2,000
0 - 1,000
'6 County Name' = Approximately 6 thousand tons of pollutant emitted in that County. Emissions based on NEI 99 version 2 inventory.
0 20 40 80 120 160
Miles
Iowa
Illinois
Indiana
Minneapolis--St. Paul, MN--WI
Eau Claire, WI
La Crosse, WI--MN
Dubuque, IA
Rockford, IL
Green Bay, WI
Appleton--Oshkosh--Neenah, WI
Sheboygan, WI
Milwaukee--Racine, WI
Madison, WI
Janesville--Beloit, WI
Chicago--Gary--Kenosha, IL
10 Stearns
2 Isanti
27 Sherburne
4 Chisago
3 Polk
3 Barron
1 Rusk
2 Menominee
4 Marinette
3 Lincoln
1 Langlade
12 Anoka
7 Wright
30 Washington
2 Meeker
27 Ramsey
5 St. Croix
4 Chippewa
1 Taylor
65 Hennepin
5 Dunn
15 Marathon
0 Menominee
2 Oconto
3 McLeod
3 Carver
3 Shawano
2 Door
4 Scott
26 Dakota
3 Pierce
6 Eau Claire
3 Clark
1 Sibley
1 Pepin
12 Wood
5 Portage
3 Waupaca
11 Outagamie
27 Brown
2 Kewaunee
2 Le Sueur
3 Rice
4 Goodhue
2 Wabasha
10 Buffalo
3 Jackson
3 Trempealeau
2 Waushara
9 Winnebago
2 Calumet
7 Manitowoc
1 Adams
5 Winona
7 La Crosse
5 Monroe
2 Marquette
6 Fond du Lac
23 Sheboygan
4 Juneau
1 Green Lake
2 Fillmore
2 Houston
7 Vernon
21 Columbia
5 Dodge
6 Washington
1 Richland
4 Sauk
1 Winneshiek
6 Allamakee
2 Crawford
7 Ozaukee
24 Dane
1 Iowa
6 Jefferson
19 Waukesha
61 Milwaukee
2 Clayton
10 Grant
8 Racine
1 Lafayette
2 Green
11 Rock
7 Walworth
31 Kenosha
1 Delaware
8 Dubuque
3 Jo Daviess
3 Stephenson
14 Winnebago
7 McHenry
30 Lake
3 Boone
1 Jones
2 Jackson
2 Carroll
5 Ogle
12 Kane
6 DeKalb
35 DuPage
5 Whiteside
5 Lee
253 Cook
3 Kendall
46 Porter
17 LaPorte
56 Will
71 Lake
15 La Salle
9 Grundy
3 Stark
8 Kankakee
33 Jasper
1 Newton
5 Livingston
5 Iroquois
2 Ford


VOC - EPA 99
NEI Draft v2
OUNTY EMISSIONS
(tons per year)
> 10,001
5,001 - 10,000
2,001 - 5,000
1,001 - 2,000
0 - 1,000
'6 County Name' = Approximately 6 thousand tons of pollutant emitted in that County. Emissions based on NEI 99 version 2 inventory.
0 20 40 80 120 160
Miles
Minneapolis--St. Paul, MN--WI
Eau Claire, WI
La Crosse, WI--MN
Dubuque, IA
Rockford, IL
Green Bay, WI
Appleton--Oshkosh--Neenah, WI
Sheboygan, WI
Milwaukee--Racine, WI
Madison, WI
Janesville--Beloit, WI
Chicago--Gary--Kenosha, IL--IN--WI
Iowa
Illinois
Indiana

6. Jurisdictional Boundaries, Metropolitan Area Definitions and Related Disc

This evaluation describes the current boundaries of areas designated nonattainment for 1-hour ozone in 1990. It also notes Wisconsin metropolitan areas adjacent to these ozone areas to the west and south. Map 6-1 is a picture of the formal 1999 Lake Michigan Region metropolitan statistical areas. Map __ is a picture of counties Wisconsin identified as metropolitan areas following the 2000 census. A brief description of the counties recording violation air quality for the 8-hour ozone standard and those being evaluated as potentially contributing to violations in Wisconsin follows. These descriptions focus on jurisdictional issues associated with ozone planning. All the areas described are in southern or eastern Wisconsin and can be considered to be within the Lake Michigan ozone air shed. If designated nonattainment by EPA for 8-hour ozone, they would be part of the multi-state region evaluated for a coordinated regional attainment demonstration focused on 2009 or 2010.

For 1-Hour Ozone, Wisconsin continues to have 1 violating area in 2003 – the 6 county SE Wisconsin nonattainment area that includes the counties of Milwaukee, Racine, Kenosha, Waukesha, Washington and Ozaukee. The area includes all of the Milwaukee-Racine CMSA and the Kenosha County portion of the Chicago-Gary-Kenosha CMSA. Wisconsin has pursued the ozone planning responsibility for Kenosha County since the first Ozone SIP (1982). The South East Wisconsin Regional Planning Commission (SEWRPC) acts as the MPO for purposes of 1-hour ozone conformity assessment and maintains a transportation planning network that includes the 6 counties plus the attainment-maintenance county of Walworth. Separate conformity budgets have historically been crafted for the Walworth and 6-county areas due to their differing 1-hour ozone classification, but the transportation network is a single 7-county area. The new Metropolitan area boundaries crafted in 2003 for the SE area remain consistent with the 1999 boundaries.

Walworth County continues to be identified as a non-metropolitan area following the 2003 census. Though it has strong commuting to both the SE WI and Chicago metro areas, the level is not sufficient to define the county as part of either CMSA. It is included in the SEWRPC regional transportation network plan and SEWRPC acts as the planning entity for conformity assessments. Walworth County was classified as a marginal 1-hour nonattainment area in 1990 and is now redesignated and classified as attainment maintenance. The county is part of DNR's SE region. DNR is recommending that the county be designated as attainment with the 8-hour standard based on 2000-2002 data.

Sheboygan County was a single county metropolitan area in 1999 and remains a single county MSA in the 2003 definitions. The county has a net inflow of commuters but bordering county levels are not sufficient to broaden the MSA area. The county is included in DNR's SE region. The county is served by Bay Lakes Regional Planning Commission for purposes of travel planning. Bay Lakes has shifted recently to a county-wide network model to support transportation planning and conformity assessment. The county is now attainment-maintenance for the 1-hour ozone standard but was classified as moderate nonattainment in 1990. Its 2000-2002 1-hour design value is 0.123 ppm (123 ppb). The county is not part of a larger planning region for air quality planning purposes. Earlier proposals had suggested the possibility of combination of the county with the SE area, but both MPOs opposed that approach. DNR is recommending the area continue as a single county nonattainment area for 8-hour ozone.

Manitowoc County contains a newly defined *Micropolitan* area including the area around Manitowoc (city) as part of OMB's new definition of metro areas. Outbound commuting is not sufficient to include the county in neighboring MSA's. Prior to the 2002 census, the area fell below formal metropolitan area thresholds. DOT acts as the planning organization for transportation plans for the county. The county is part of the DNR's NE region. The county was classified as moderate ozone nonattainment in 1990. It has just attained the standard and is being redesignated and classified as attainment maintenance. Its 1-hour ozone design value for 2000-2002 is 0.109 ppm. DNR is recommending that it become a part of the NE Wisconsin nonattainment area for the 8-hour ozone standard.

Kewaunee County was identified as a non-metropolitan area prior to the 2000 census. OMB has recently indicated that it will become part of the Green Bay Metropolitan area which also will include Brown and Oconto counties. This is because almost half the county workforce commutes to Brown County for jobs. DOT has acted as the planning organization for transportation plans for the county and has historically pursued its conformity assessments. The county was classified as a moderate 1-hour ozone nonattainment area in 1990. It is now redesignated and classified as attainment-maintenance. The 2000-2002 1-hour design value is 0.103 ppm. The county is part of DNR's NE region. DNR is recommending that it become a part of the NE Wisconsin nonattainment area for the 8-hour ozone standard.

Door County continues to be identified as a non-metropolitan area in 2003. The county does not have high outbound commuting rates. The county was classified as a marginal 1-hour ozone rural nonattainment area impacted by overwhelming transport in 1990. DOT has acted as the planning organization for transportation plans for the county and has historically pursued its conformity assessments. It is now redesignated and classified as attainment-maintenance. The 2000-2002 1-hour design value is 0.110 ppm. The county is part of DNR's NE region. DNR is recommending that it become a part of the NE Wisconsin nonattainment area for the 8-hour ozone standard.

Brown County is part of the newly defined 3-county Green Bay metropolitan area including Oconto, Brown and Kewaunee counties identified by OMB in 2003 based on the 2000 census. As the core city, Green Bay provides a significant job base for the surrounding counties. Prior to the 2000 census, the area was defined as a single county MSA. It has not violated the 1-hour ozone standard and was designated attainment in 1990. Conformity assessments are not required in the area though it maintains a transportation planning network that covers part of the expanded metropolitan area. A local Green Bay metropolitan planning organization (part of the Brown County Planning Commission) is responsible for transportation plan development though the county is part of the Bay-Lakes planning area. The county is part of DNR's NE region. Wisconsin is recommending designation of Brown County as attainment based on the 2000-2002 data and in consideration of the 1999 MSA definition.

Calumet, Outagamie and Winnebago counties make up the 3-county Appleton-Neenah-Oshkosh metropolitan area which in 2003 became a Consolidated area with 2 sub-area (MSAs) – north and south. The counties are all attainment for the 1-hour ozone standard. The are very high inter-county commuting rates between the three counties. Separate local planning organizations (MPO's) pursue transportation planning for the urbanized portions of the area using the staff of the East-Central Regional Planning Commission which would probably be responsible for conformity assessments. The counties are part of DNR's NE region. Wisconsin is recommending designation of these counties as attainment based on the 2000-2002 data.

Fond du Lac County is newly identified as a single county metropolitan area under the 2003 census. Outbound commuting is not sufficient to include the county in neighboring MSA's. A local transportation planning entity is responsible for local transportation planning, but like the rest of the Lake Winnebago, upper Fox River Valley area the East-Central RPC would take responsibility for conformity assessment if required in the future. The county is part of DNR's NE region. The county is attainment with the 1-hour ozone standard. Wisconsin is recommending designation of this county as attainment based on the 2000-2002 data.

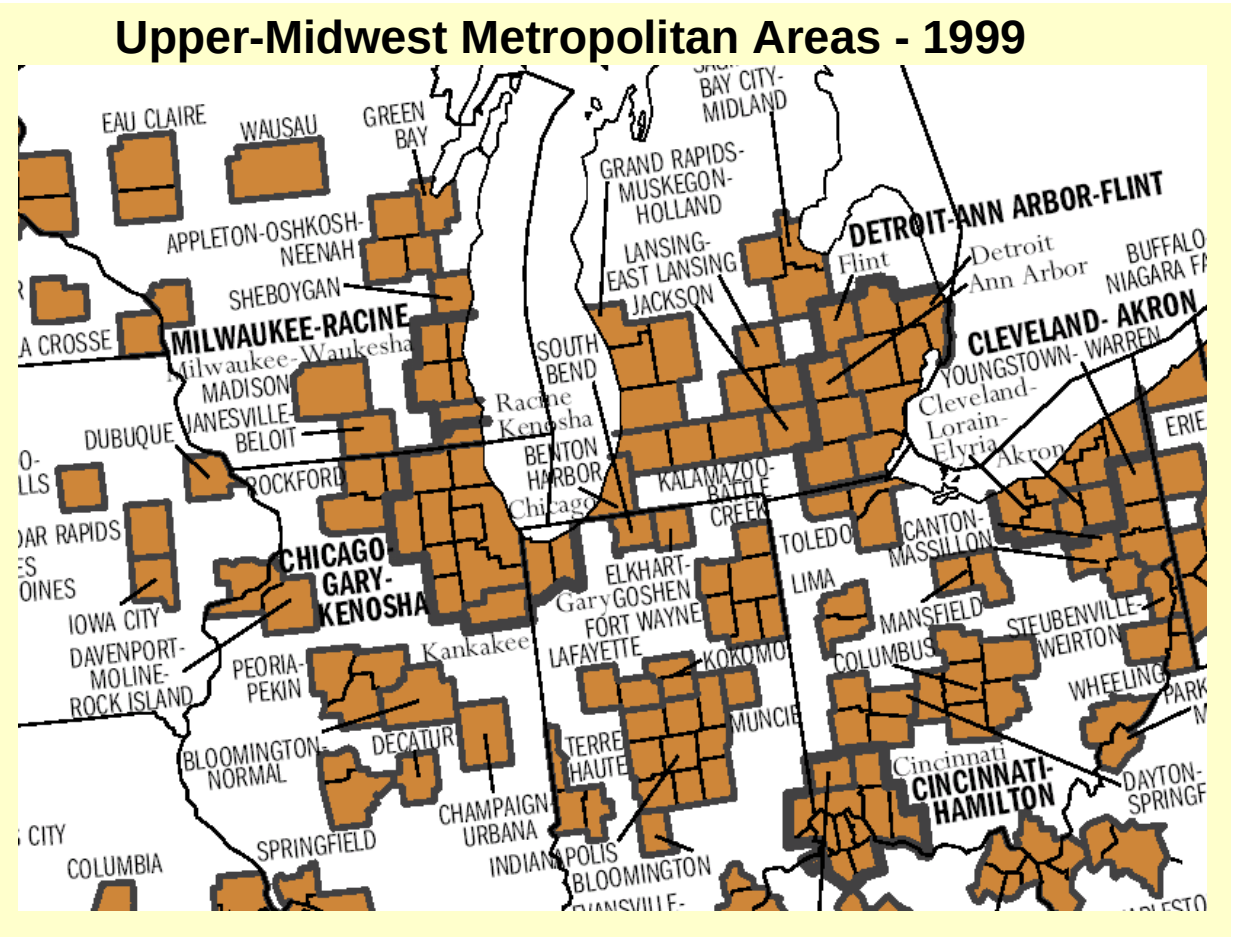
Dodge County remains a non-metropolitan county after the 2000 census. The county is part of DNR's SC region. DOT is the responsible organization for transportation plans. The county is attainment with the 1-hour ozone standard. Wisconsin is recommending designation of this county as attainment based on the 2000-2002 data.

Jefferson County remains a predominantly non-metropolitan county after the 2000 census though it includes a portion of a new Watertown-Fort Atkinson micropolitan area. The county is part of DNR's SC region. DOT is the responsible organization for transportation plans. The county is attainment with the 1-hour ozone standard. Because of an incomplete monitor record for 2000, Wisconsin is withholding a recommendation for the attainment/nonattainment status recommendation until the close of the 2003 monitoring season in anticipation that a complete 2001-2003 AQ record will better direct EPA's designation decision.

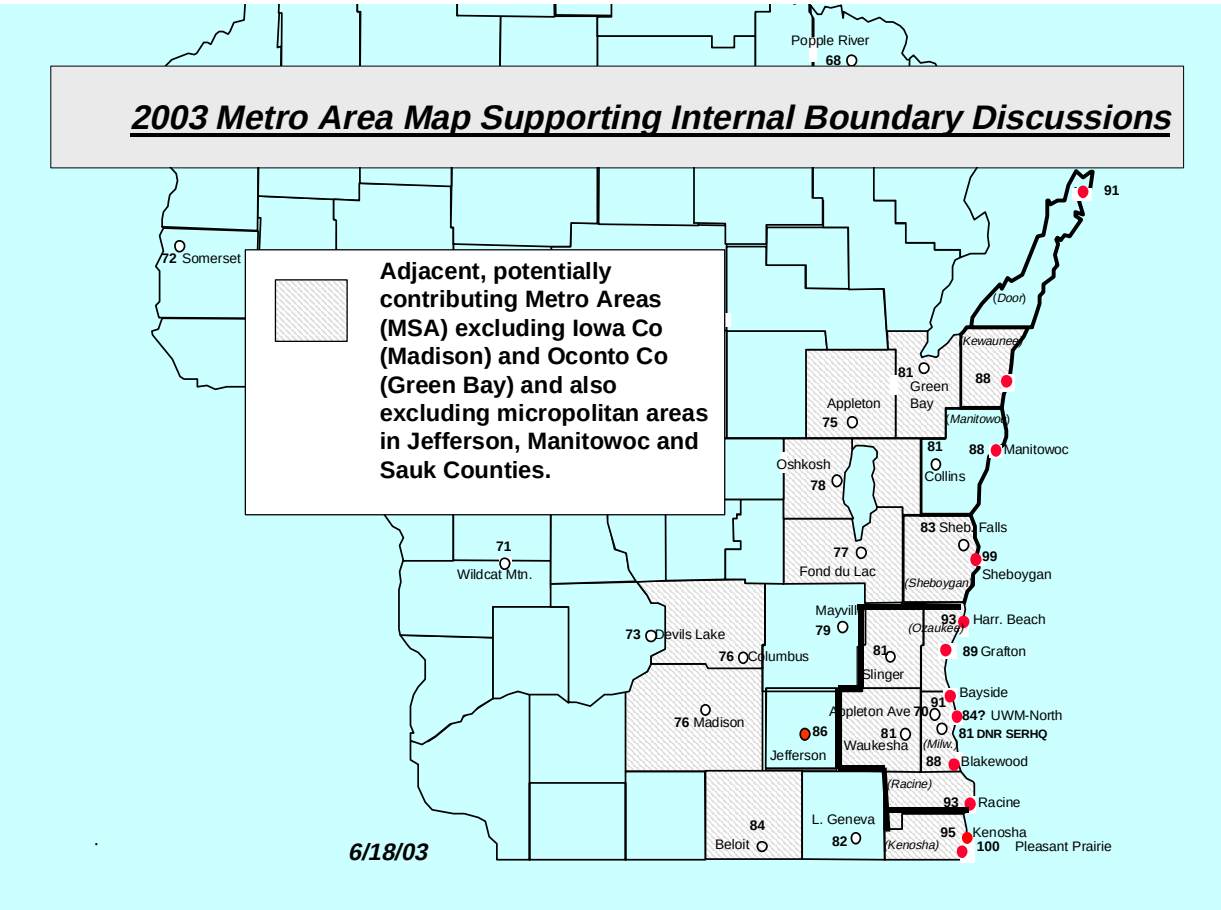
Dane, Columbia and Iowa counties are part of an enlarged Consolidated Metropolitan area surrounding Madison. A Madison planning organization has responsibility for much of Dane County transportation planning. DOT has responsibility for the rest of Dane and Columbia and Iowa counties. The counties are part of the DNR SC region. The counties are attainment with the 1-hour ozone standard. Wisconsin is recommending designation of these counties as attainment based on the 2000-2002 data.

Rock and Green Counties are part of an enlarged two-county metropolitan area surrounding Janesville and Beloit after the 2000 census. At this point the local transportation planning responsibility would be shared by the Janesville and Beloit MPO's in concert with the Rock County planning department. The county is not identified as part of a cross-border metropolitan area though an interstate planning organization does address the south Beloit/Rockford transportation corridor. The area attains the 1-hour ozone standard. Wisconsin is recommending designation of these counties as attainment based on the 2000-2002 data.

All other counties in Wisconsin are further away from the 8-hour violation and near-violation sites. No other metropolitan area in the state is adjacent to a county violating or nearing violation of the standard and they are considered as not directly contributing to the violation levels in the state.



Maps 6-1 and 6-2 : 1999 and 2003 Metropolitan Areas identified by the Office of Management and Budget



07/16/03

7) Modeled Contribution Assessment for Nearby Counties

The following maps portray the impact of NOx plus VOC emissions, NOx emissions alone and aggregate Mobile Sector emissions for the areas in Wisconsin assessed for potential contribution to violating sites. The counties included in the assessment include the area of south central and east central and north east Wisconsin presumed through population and emissions assessments to have a potential to impact the violation status of other counties in the state - both with elevated but attainment readings and those with violating readings. The assessment formed a basis for an earlier air program recommendation to designate a larger area based on a full assessment of contribution and the impact of the base emissions from the contributing areas on the monitored violation status for downwind areas. The assessment of this episode led to such a contribution conclusion for areas in northeastern, south central and east central Wisconsin.

See the following Summary of June 2002 Contribution Assessment

8) Projected Impact of Existing and Fully-adopted Regional and National Controls on the Attainment Status of areas at or near violation of the 8-Hour Standard

Recent assessments by EPA in support of the Clear Skies power plant emissions reduction initiative [2002] indicate that the sensitive monitors along and near to the Lake Michigan shoreline are likely to remain nonattainment with the 8-Hour ozone standard well beyond the 2010 attainment date expected for the area. These evaluations have included the projected benefit of the NOx SIP call and national motor vehicle and engine emission controls which have yet to be fully implemented. Similar assessments specific to the Lake Michigan region performed in support of the 1-Hour ozone attainment demonstration indicated that the regional programs do not lead to attainment of the 8-hour standard in the region. In addition, the scope of regional control impact on Wisconsin areas is limited because the state is not included in the current phases of the NOx SIP call program and there is no strong indication that areas of the state would be included in any yet-to-be proposed 2nd phase of the NOx SIP call.

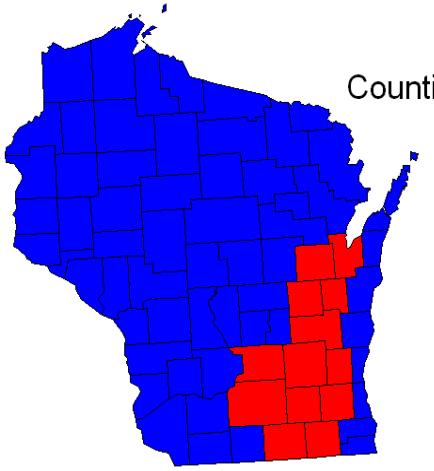
2001 - June Episode
Fringe Area Impact Assessment

Wisconsin Collar Counties

NAAQS 8-hour Ozone Standard Analysis

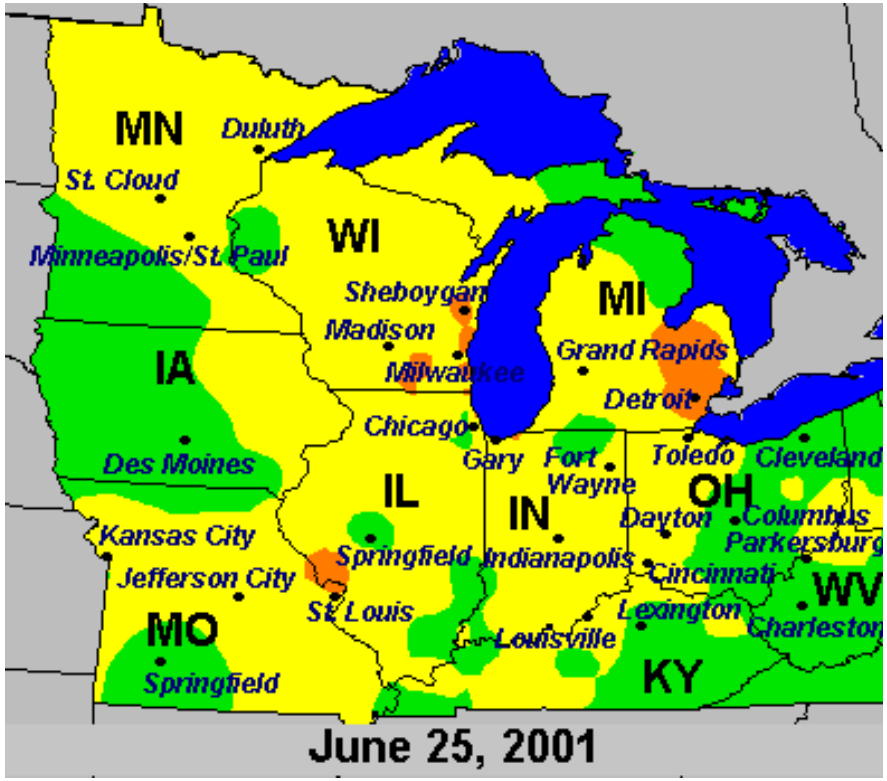
The following pages detail the modeled effect of eliminating ozone precursor emissions from all the major man-made sectors(NOx and VOC) from the non-Lake Shore Counties ranging from Rock County through Brown County during a five day ozone episode in June 2001. The area with "zero-outed" emissions includes the Dane Co and Fox Valley regions along with the directly adjacent collar counties to the lakeshore counties that have historically been associated with high ozone. The map to the right shows the counties assessed for emissions.

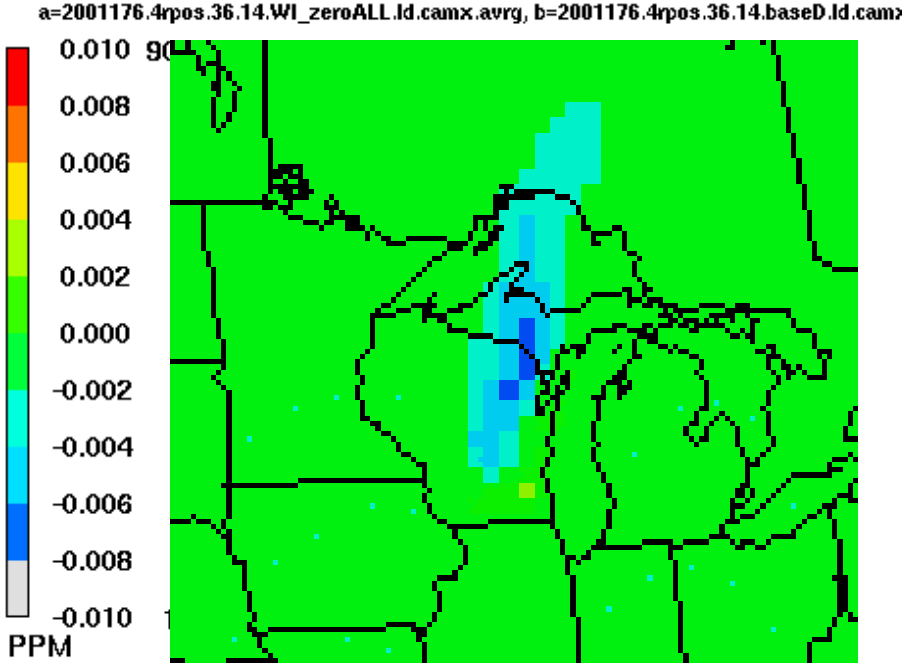
EPA AIRNOW 8-Hour Ozone Maps characterize the scope of elevated 8-hour ozone concentrations in the midwest during each day of the 5-day episode. Associated with each day's map is a picture of the modeled ambient ozone level result from the zero-out of both VOC and NOx and then only NOx. The results show an ozone decrease in ppm by 36km grid cell.

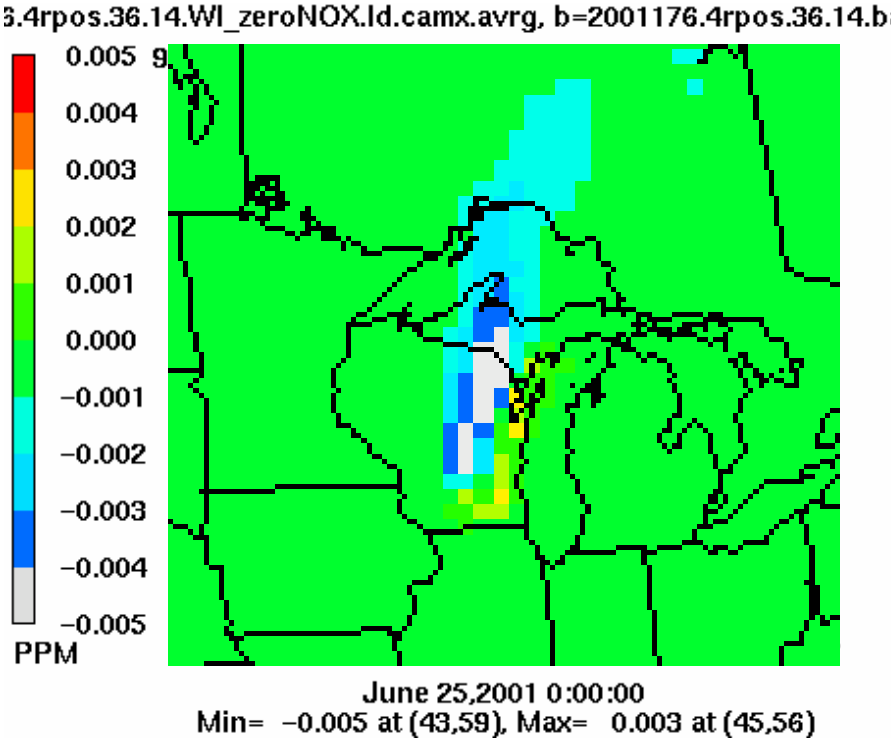


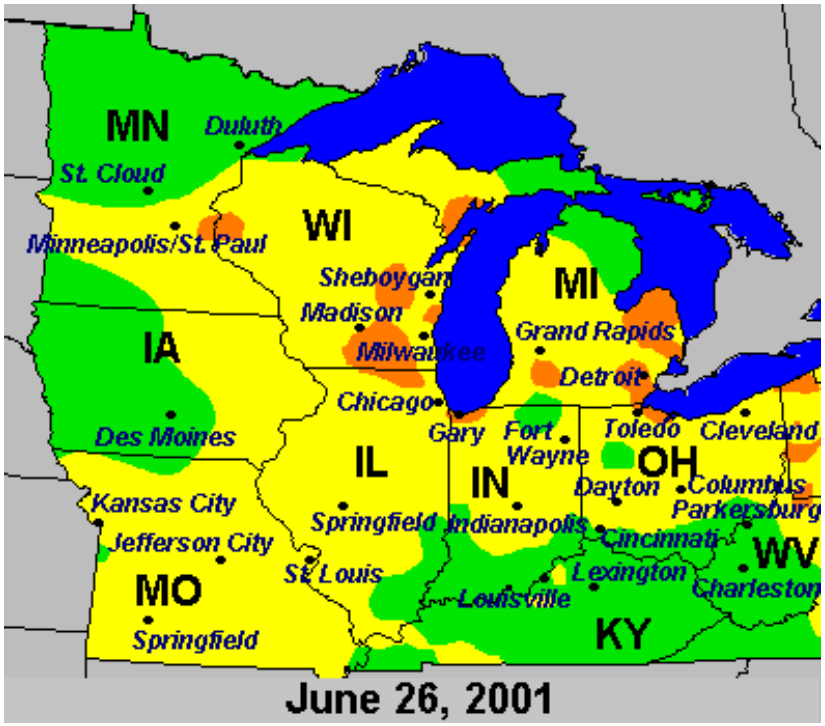
Counties Include:
Brown
Calume
Columbia
Dane
Dodge
Fond du Lac
Jefferson
Outagamie
Rock
Walworth
Washington
Waukesha
Winnebago

Prepared by Gwendolyn Judson, WDNR. May 2003

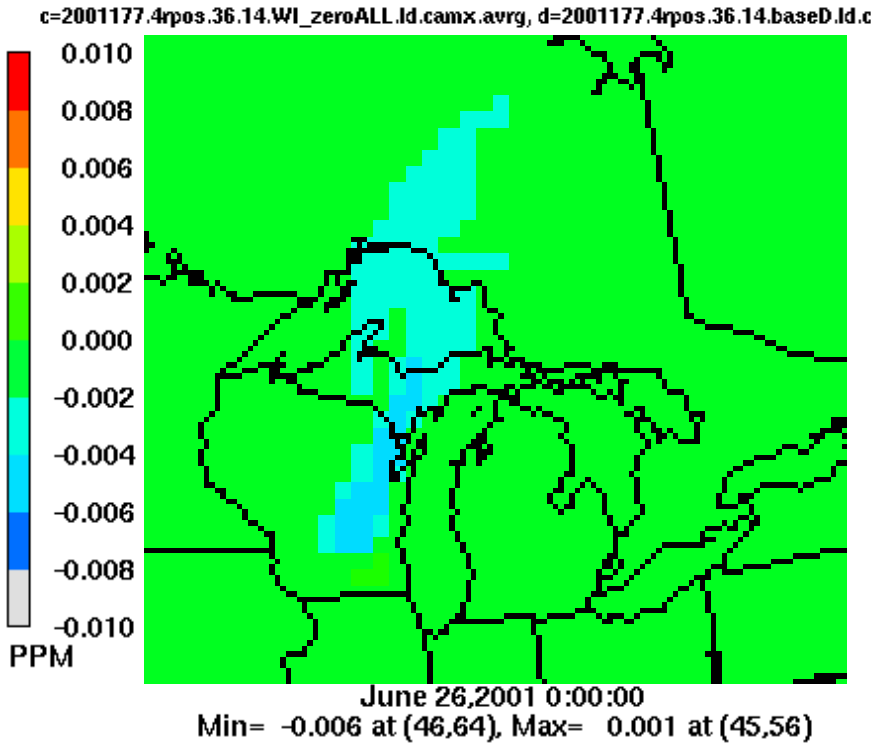


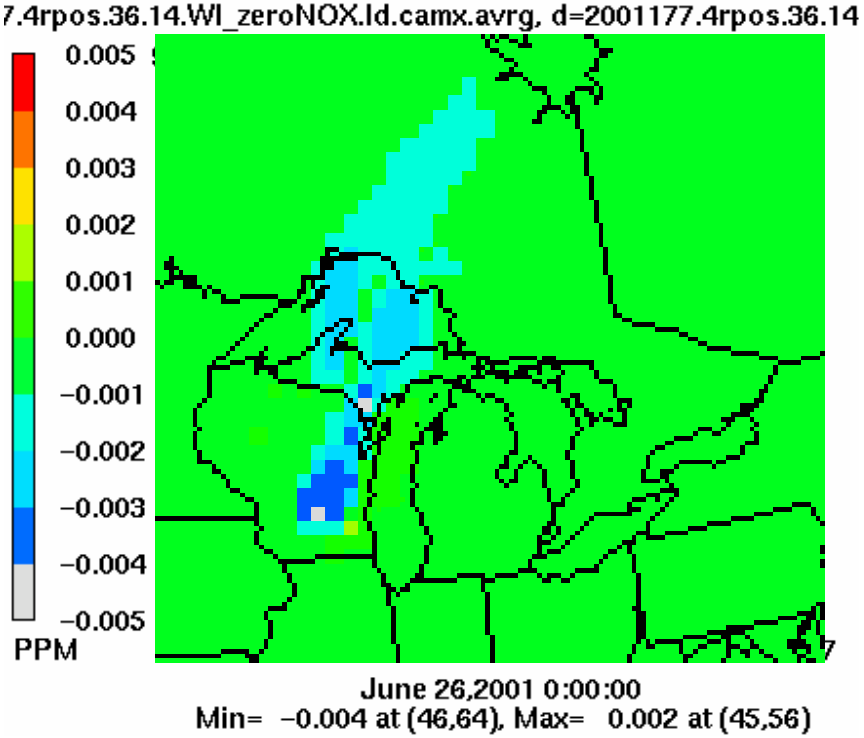


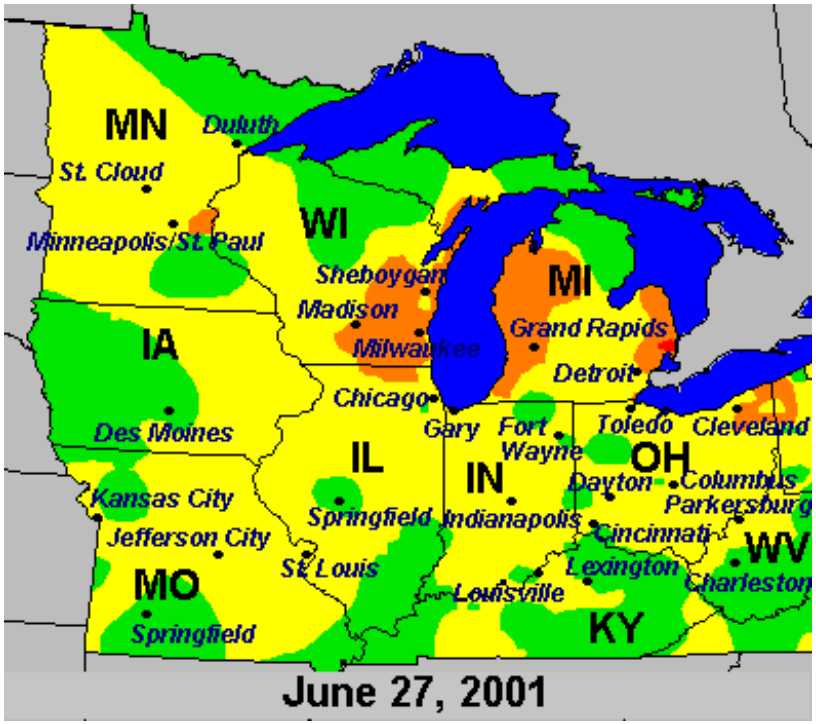




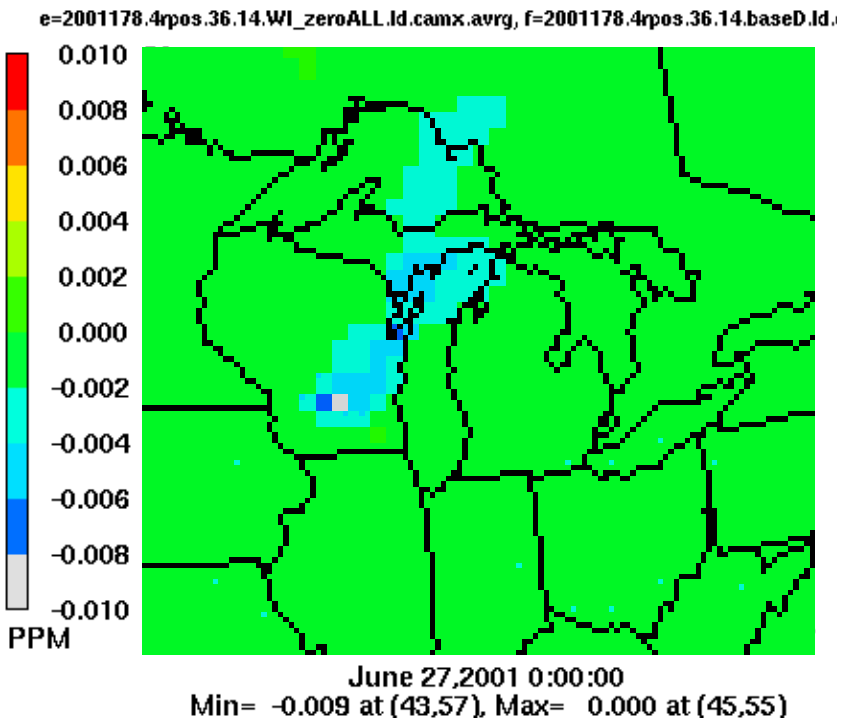
During the first two days of the regional episode, widespread ozone develops across Wisconsin and other parts of the upper midwest. This part of the episode is characterized by a moderate S, SSW, then SW flow which extends the impact of polutants to the NNE. The footprint of the VOC and NOx emissions of the local inventory extends beyond NE Wisconsin into the Northern Michigan peninsula and Ontario. A slight disbenefit picture in Day 1 (June 25) associated with the NOx control on the edge of the nonattainment areas is mostly a result of the 36 km grid used in these sensitivity assessments. Any disbenefit from NOx control disappears during the following episode days. During Day 1 the maximum impact shown during this episode is approximately 7 ppb with a likely impact on the sensitive (violating or near violating sites) areas of 2-5 ppb. A similar, but slightly more widespread impact is shown during Day 2. The impact of NOx emissions alone is upward of 60-70% of the impact shown by aggregate VOC and NOx emissions. This indicates a control approach that addresses both pollutants could be beneficial.

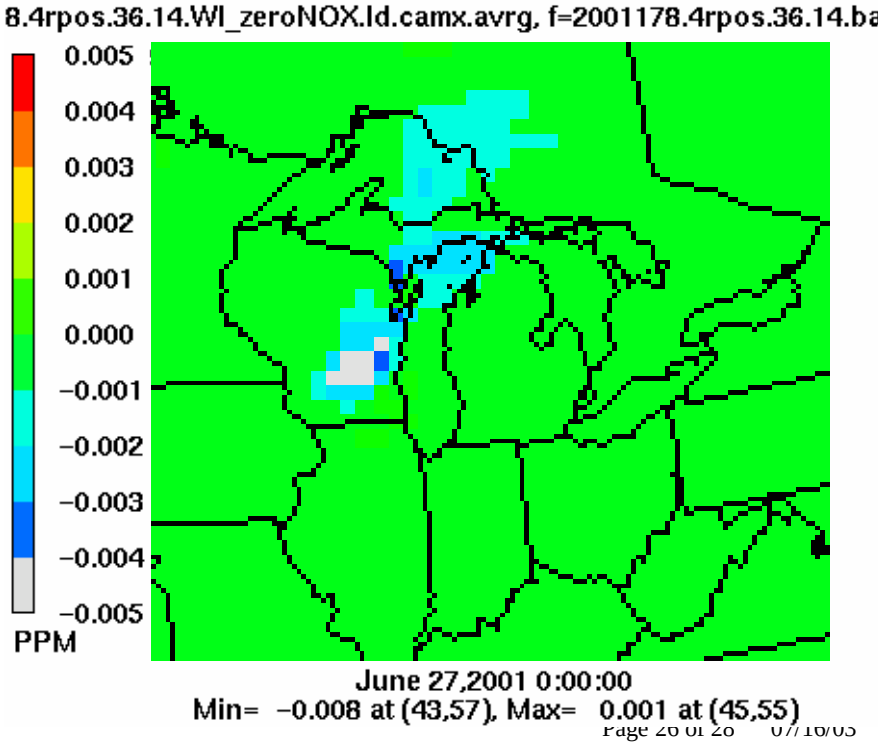


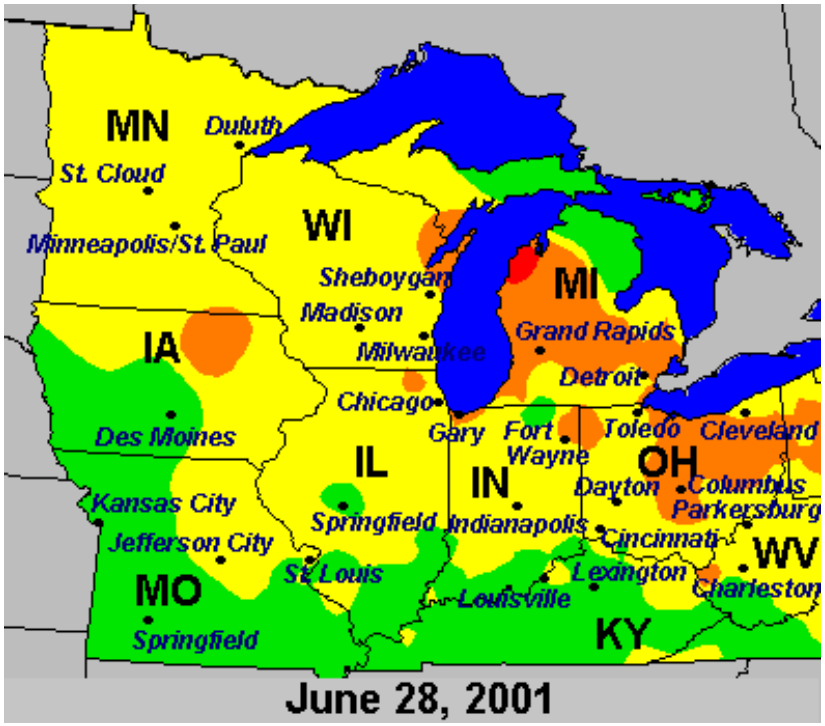


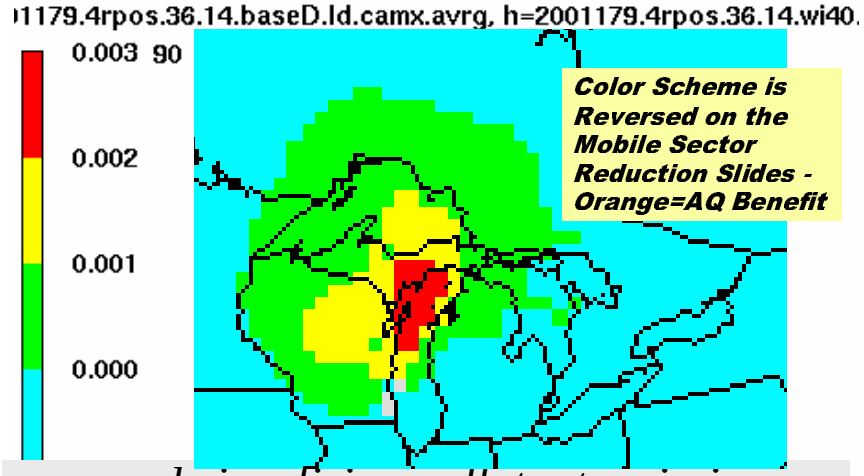


By Days 3 to 5 of the regional episode,the widespread elevated ozone continues to develop across eastern Wisconsin and becomes more severe in the eastern portions of the Lake Michigan airshed. This part of the episode is characterized by a moderate SW flow which extends the impact of polutants to the NE and E. The footprint of the VOC and NOx emissions of the local inventory extends beyond NE and E Wisconsin into the much of Michigan and to Ontario. All disbenefit from NOx control has disappeared. During Days 3-5 the maximum impact shown ranges from approximately 7-10 ppb for VOC and NOx combined to 5-7 ppb for NOx alone. The most sensitive monitors in NE WI are impacted at a level of 5-8 ppb during the later stages of the episode. The impact of NOx emissions alone remains at 60-70% of the impact shown by aggregate VOC and NOx emissions though the footprints are slightly different. During this portion of the episode both pollutants remain important to the elevated ozone concentrations at sensitive monitors. A more limited statewide evaluation of Mobile Sector emissions sensitivity, incorporating a 40% sector emissions reduction level (including reductions in the core nonattainment areas) shows an important footprint of impact for that sector's emissions on sensitive areas of the region. [Note a reversal of color schemes for that assessment.]

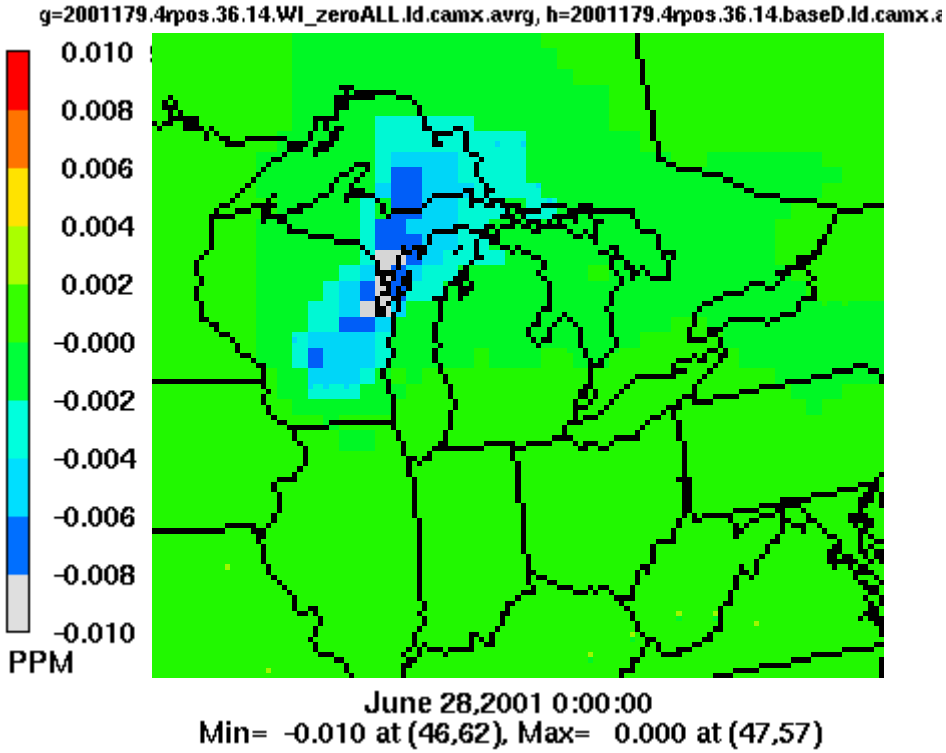


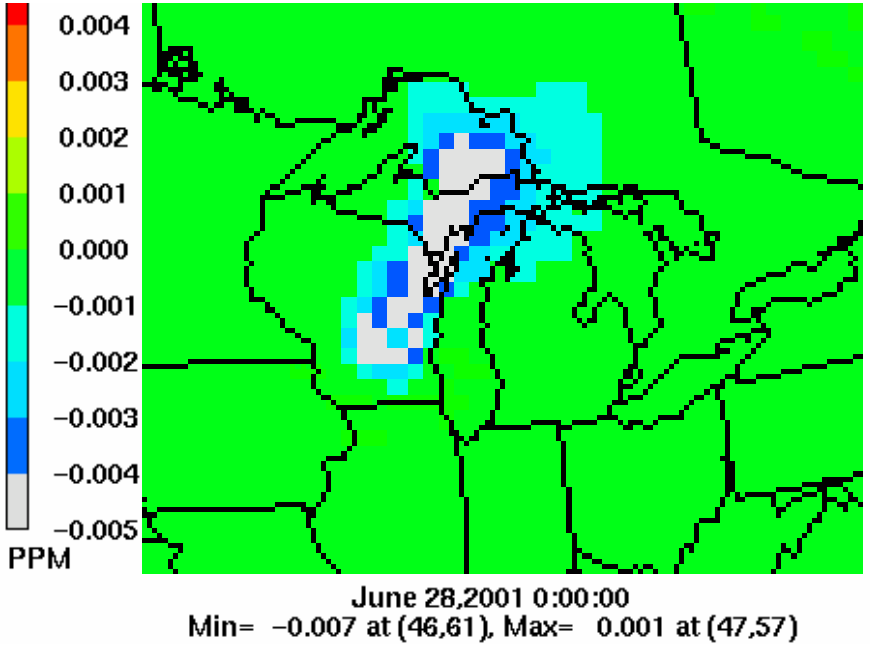


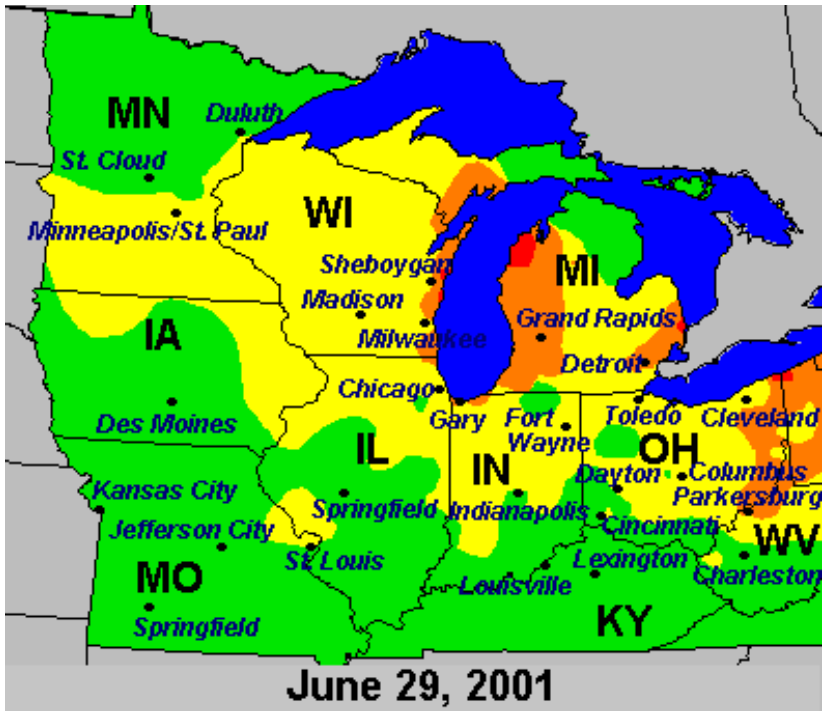




…and visualizing pollutant emissions impacts….here from mobile sector reductions of 40%







Example - WI Vehicle Pollutant Emissions Footprint